

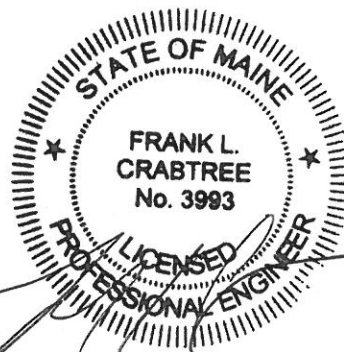
HARRIMAN

**IMMUCELL CORPORATION
BUILDING ADDITION**

Portland, Maine

**City of Portland
Development Review Application**

May 22, 2014



Owner:
ImmuCell Corporation

Architect/Engineer:
Harriman



Jeff Levine, AICP, Director
Planning & Urban Development Department

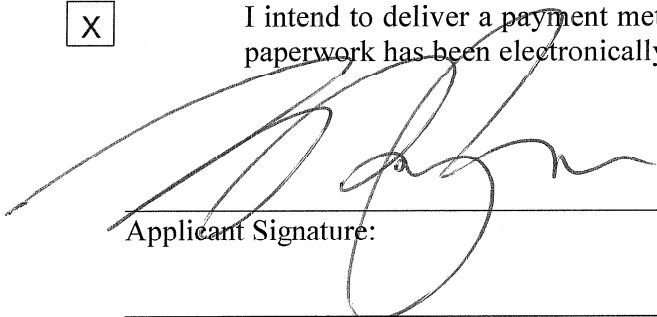
Electronic Signature and Fee Payment Confirmation

Notice: Your electronic signature is considered a legal signature per state law.

By digitally signing the attached document(s), you are signifying your understanding this is a legal document and your electronic signature is considered a **legal signature** per Maine state law. You are also signifying your intent on paying your fees by the opportunities below.

I, the undersigned, intend and acknowledge that no Site Plan or Historic Preservation Applications can be reviewed until payment of appropriate application fees are **paid in full** to the Inspections Office, City of Portland Maine by method noted below:

- Within 24-48 hours, once my complete application and corresponding paperwork has been electronically delivered, I intend to **call the Inspections Office** at 207-874-8703 and speak to an administrative representative and provide a credit/debit card over the phone.
- Within 24-48 hours, once my application and corresponding paperwork has been electronically delivered, I intend to **call the Inspections Office** at 207-874-8703 and speak to an administrative representative and provide a credit/debit card over the phone.
- I intend to deliver a payment method through the U.S. Postal Service mail once my application paperwork has been electronically delivered.



 Applicant Signature:

5/21/14

 Date:

_____ Date:
 I have provided digital copies and sent them on:

NOTE: All electronic paperwork must be delivered to buildinginspections@portlandmaine.gov or by physical means i.e. a thumb drive or CD to the Inspections Office, City Hall, 3rd Floor, Room 315.



Level II – Preliminary and Final Site Plans Development Review Application Portland, Maine

Planning and Urban Development Department
Planning Division

Portland's Planning and Urban Development Department coordinates the development review process for site plan, subdivision and other applications under the City's Land Use Code. Attached is the application form for a Level II: Preliminary or Final Site Plan. Please note that Portland has delegated review from the State of Maine for reviews under the Site Location of Development Act, Chapter 500 Stormwater Permits, and Traffic Movement Permits.

Level II: Site Plan Development includes:

- New construction of structures with a total floor area of less than 10,000 sq. ft. in all zones, except in Industrial Zones.
- New construction of structures with a total floor area of less than 20,000 sq. ft. in Industrial Zones.
- Any new temporary or permanent parking area, paving of an existing unpaved surface parking area in excess of 7,500 sq. ft. and serving less than 75 vehicles, or creation of other impervious surface area greater than 7,500 sq. ft.
- Building addition(s) with a total floor area of less than 10,000 sq. ft. (cumulatively within a 3 year period) in any zone, except in Industrial Zones.
- Building addition(s) with a total floor area of less than 20,000 sq. ft. in Industrial Zones.
- Park improvements: New structures or buildings with a total floor area of less than 10,000 sq. ft., facilities encompassing an area of greater than 7,500 sq. ft. and less than 20,000 sq. ft. (excludes rehabilitation or replacement of existing facilities).
- New construction of piers, docks, wharves, bridges, retaining walls, and other structures within the Shoreland Zone.
- Land disturbance between 1 and 3 acres that are stripped, graded, grubbed, filled or excavated.
- A change in the use of a total floor area between 10,000 and 20,000 sq. ft. in any existing building (cumulatively within a 3 year period).
- Lodging house, bed and breakfast facility, emergency shelter or special needs independent living unit.
- Signage subject to approval pursuant to Section 14-526 (d) 8.a. of the Land Use Code.
- Any new major or minor auto service station with less than 10,000 sq. ft. of building area in any permitted zone other than the B-2 or B-5 zones.
- The creation of day care or home babysitting facilities to serve more than 12 children in a residential zone (not permitted as a home occupation under section 14-410) in any principal structure that has not been used as a residence within the 5 years preceding the application.
- Any drive-through facility that is not otherwise reviewed as a conditional use under Article III.

Portland's development review process and requirements are outlined in the Land Use Code (Chapter 14) which is available on our website:

Land Use Code: <http://me-portland.civicplus.com/DocumentCenter/Home/View/1080>

Design Manual: <http://me-portland.civicplus.com/DocumentCenter/View/2355>

Technical Manual: <http://me-portland.civicplus.com/DocumentCenter/View/2356>

Planning Division
Fourth Floor, City Hall
389 Congress Street
(207) 874-8719

Office Hours
Monday thru Friday
8:00 a.m. – 4:30 p.m.

PROJECT NAME: IMMUCELL CORPORATION ADDITION

PROPOSED DEVELOPMENT ADDRESS:

56 Evergreen Drive, Portland, ME 04103

PROJECT DESCRIPTION:

Expansion of manufacturing building with increased warehousing and loading dock space, including small expansion of paved parking and maneuvering areas.

CHART/BLOCK/LOT: 329-A3-1 & 331-A4-1

PRELIMINARY PLAN
FINAL PLAN

N.A. (date)
5-21-14 (date)

CONTACT INFORMATION:

Applicant – must be owner, Lessee or Buyer Name: Michael Brigham Business Name, if applicable: Immucell Corporation Address: 56 Evergreen Drive City/State : Portland/ME Zip Code: 04103	Applicant Contact Information E-mail: mbrigham@immucell.com Home #: Work #: (207) 878-2770 Cell #: Fax#:
Owner – (if different from Applicant) Name: Same Address: City/State : Zip Code:	Owner Contact Information E-mail: Same Home #: Work #: Cell #: Fax#:
Agent/ Representative Name: Frank Crabtree, PE Address: Harriman, 46 Harriman Drive City/State : Auburn/ME Zip Code: 04210	Agent/Representative Contact information E-mail: fcrabtree@harriman.com Home #: (207) 225-3981 Work #: (207) 784-5100 Cell #: (207)577-3731 Fax#: (207) 782-3017
Billing Information Name: Michael Brigham - Immucell Corp. Address: 56 Evergreen Drive City/State : Portland/ME Zip Code: 04103	Billing Information E-mail: mbrigham@immucell.com Home #: Work #: (207) 878-2770 Cell #: Fax#:

Engineer Name: Frank Crabtree, PE Address: Harriman, 46 Harriman Drive City/State : Auburn/ME Zip Code: 04210	Engineer Contact Information E-mail: fcrabtree@harriman.com Home #: Work #: (207) 784-5100 Cell #: Fax#:
Surveyor Name: Eric F. Cooke, LS Address: SGC, 12 Westbrook Commons City/State : Westbrook/ME Zip Code: 04092	Surveyor Contact Information E-mail: sgc@sgcinc.net Home #: Work #: (207) 856-0007 Cell #: Fax#:
Architect Name: Daniel Cecil, AIA Address: Harriman, 46 Harriman Drive City/State : Auburn/ME Zip Code: 04210	Architect Contact Information E-mail: dcecil@harriman.com Home #: Work #: (207) 784-5100 Cell #: Fax#:
Attorney Name: N.A. Address: City/State : Zip Code:	Attorney Contact Information E-mail: Home #: Work #: Cell #: Fax#:

APPLICATION FEES:

Check all reviews that apply. (Payment may be made by Credit Card, Cash or Check payable to the City of Portland.)

Level II Development (check applicable reviews) <input checked="" type="checkbox"/> Less than 10,000 sq. ft. (\$400) <input type="checkbox"/> After-the-fact Review (\$1,000 plus applicable application fee) <hr/> The City invoices separately for the following: <ul style="list-style-type: none"> • Notices (\$.75 each) • Legal Ad (% of total Ad) • Planning Review (\$40.00 hour) • Legal Review (\$75.00 hour) Third party review fees are assessed separately. Any outside reviews or analysis requested from the Applicant as part of the development review, are the responsibility of the Applicant and are separate from any application or invoice fees.	Other Reviews (check applicable reviews) <input type="checkbox"/> Traffic Movement (\$1,000) <input type="checkbox"/> Stormwater Quality (\$250) <input type="checkbox"/> Site Location (\$3,000, except for residential projects which shall be \$200/lot) # of Lots ___ x \$200/lot = _____ <input type="checkbox"/> Other _____ <input type="checkbox"/> Change of Use <input type="checkbox"/> Flood Plain <input type="checkbox"/> Shoreland <input type="checkbox"/> Design Review <input type="checkbox"/> Housing Replacement <input type="checkbox"/> Historic Preservation
---	--

APPLICATION SUBMISSION:

1. All site plans and written application materials must be submitted electronically on a CD or thumb drive with each plan submitted as separate files, with individual file which can be found on the **Electronic Plan and Document Submittal** page of the City's website at <http://me-portland.civicplus.com/764/Electronic-Plan-and-Document-Submittal>
2. In addition, one (1) paper set of the plans (full size), one (1) paper set of plans (11 x 17), paper copy of written materials, and the application fee must be submitted to the Building Inspections Office to start the review process.

The application must be complete, including but not limited to the contact information, project data, application checklists, wastewater capacity, plan for fire department review, and applicant signature. The submissions shall include one (1) paper packet with folded plans containing the following materials:

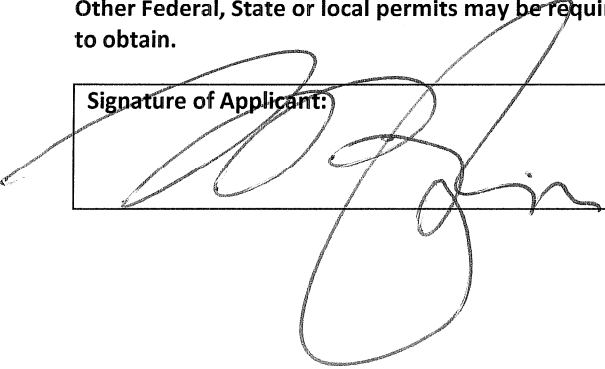
1. One (1) full size site plans that must be folded.
2. One (1) copy of all written materials or as follows, unless otherwise noted:
 - a. Application form that is completed and signed.
 - b. Cover letter stating the nature of the project.
 - c. All Written Submittals (Sec. 14-527 (c), including evidence of right, title and interest.
3. A stamped standard boundary survey prepared by a registered land surveyor at a scale not less than one inch to 50 feet.
4. Plans and maps based upon the boundary survey and containing the information found in the attached sample plan checklist.
5. One (1) set of plans reduced to 11 x 17.

Please refer to the application checklist (attached) for a detailed list of submission requirements.

APPLICANT SIGNATURE:

I hereby certify that I am the Owner of record of the named property, or that the owner of record authorizes the proposed work and that I have been authorized by the owner to make this application as his/her authorized agent. I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in this application is issued, I certify that the Planning Authority and Code Enforcement's authorized representative shall have the authority to enter all areas covered by this permit at any reasonable hour to enforce the provisions of the codes applicable to this permit.

This application is for a Level II Site Plan review. It is not a permit to begin construction. An approved site plan, a Performance Guarantee, Inspection Fee, Building Permit, and associated fees will be required prior to construction. Other Federal, State or local permits may be required prior to construction, which are the responsibility of the applicant to obtain.

Signature of Applicant: 	Date: 5/21/14
---	------------------

PROJECT DATA

The following information is required where applicable, in order to complete the application.

Total Area of Site	60,548	sq. ft.
Proposed Total Disturbed Area of the Site	19,500	sq. ft.
If the proposed disturbance is greater than one acre, then the applicant shall apply for a Maine Construction General Permit (MCGP) with DEP and a Stormwater Management Permit, Chapter 500, with the City of Portland		
Impervious Surface Area		
Impervious Area (Total Existing) including Building	42,240	sq. ft.
Impervious Area (Total Proposed) including Building	43,110	sq. ft.
Building Ground Floor Area and Total Floor Area		
Building Footprint (Total Existing)	15,400	sq. ft.
Building Footprint (Total Proposed)	19,045	sq. ft.
Building Floor Area (Total Existing)	23,583	sq. ft.
Building Floor Area (Total Proposed)	30,873	sq. ft.
Zoning		
Existing	IM - Industrial - Moderate	
Proposed, if applicable	no change	
Land Use		
Existing	Manufacturing	
Proposed	Manufacturing	
Residential, if applicable		
# of Residential Units (Total Existing)	N.A.	
# of Residential Units (Total Proposed)		
# of Lots (Total Proposed)		
# of Affordable Housing Units (Total Proposed)		
Proposed Bedroom Mix		
# of Efficiency Units (Total Proposed)	N.A.	
# of One-Bedroom Units (Total Proposed)		
# of Two-Bedroom Units (Total Proposed)		
# of Three-Bedroom Units (Total Proposed)		
Parking Spaces		
# of Parking Spaces (Total Existing)	32	
# of Parking Spaces (Total Proposed)	39	
# of Handicapped Spaces (Total Proposed)	2	
Bicycle Parking Spaces		
# of Bicycle Spaces (Total Existing)	0	
# of Bicycle Spaces (Total Proposed)	8	
Estimated Cost of Project	\$750,000	

NOT USED

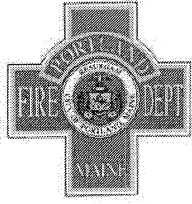
PRELIMINARY PLAN (Optional) - Level II Site Plan			
Applicant Checklist	Planner Checklist	# of Copies	GENERAL WRITTEN SUBMISSIONS CHECKLIST
		1	Completed Application form
		1	Application fees
		1	Written description of project
		1	Evidence of right, title and interest
		1	Evidence of state and/or federal approvals, if applicable
		1	Written assessment of proposed project's compliance with applicable zoning requirements
		1	Summary of existing and/or proposed easement, covenants, public or private rights-of-way, or other burdens on the site
		1	Written requests for waivers from site plan or technical standards, if applicable.
		1	Evidence of financial and technical capacity
		1	Traffic Analysis (may be preliminary, in nature, during the preliminary plan phase)
Applicant Checklist	Planner Checklist	# of Copies	SITE PLAN SUBMISSIONS CHECKLIST
		1	Boundary Survey meeting the requirements of Section 13 of the City of Portland's Technical Manual
		1	Preliminary Site Plan including the following: (information provided may be preliminary in nature during preliminary plan phase)
			Proposed grading and contours;
			Existing structures with distances from property line;
			Proposed site layout and dimensions for all proposed structures (including piers, docks or wharves in Shoreland Zone), paved areas, and pedestrian and vehicle access ways;
			Preliminary design of proposed stormwater management system in accordance with Section 5 of the Technical Manual (note that Portland has a separate applicability section);
			Preliminary infrastructure improvements;
			Preliminary Landscape Plan in accordance with Section 4 of the Technical Manual;
			Location of significant natural features (including wetlands, ponds, watercourses, floodplains, significant wildlife habitats and fisheries or other important natural features) located on the site as defined in Section 14-526 (b) (1);
			Proposed buffers and preservation measures for significant natural features, as defined in Section 14-526 (b) (1);
			Location , dimensions and ownership of easements, public or private rights of way, both existing and proposed;
			Exterior building elevations.

FINAL PLAN - Level II Site Plan			
Applicant Checklist	Planner Checklist	# of Copies	GENERAL WRITTEN SUBMISSIONS CHECKLIST (* If applicant chooses to submit a Preliminary Plan, then the * items were submitted for that phase and only updates are required)
X		1	* Completed Application form
X		1	* Application fees
X		1	* Written description of project
X		1	* Evidence of right, title and interest
N.A.		1	* Evidence of state and/or federal permits
X		1	* Written assessment of proposed project's specific compliance with applicable Zoning requirements
X		1	* Summary of existing and/or proposed easements, covenants, public or private rights-of-way, or other burdens on the site
X		1	* Evidence of financial and technical capacity
X		1	Construction Management Plan
N.A.		1	A traffic study and other applicable transportation plans in accordance with Section 1 of the technical Manual, where applicable.
N.A.		1	Written summary of significant natural features located on the site (Section 14-526 (b) (a))
X		1	Stormwater management plan and stormwater calculations, including description of project, hydrology and impervious area.
N.A.		1	Written summary of project's consistency with related city master plans
X		1	Evidence of utility capacity to serve
X		1	Written summary of solid waste generation and proposed management of solid waste
X		1	A code summary referencing NFPA 1 and all Fire Department technical standards
X		1	Where applicable, an assessment of the development's consistency with any applicable design standards contained in Section 14-526 and in City of Portland Design Manual
X		1	Manufacturer's verification that all proposed HVAC and manufacturing equipment meets applicable state and federal emissions requirements.

Applicant Checklist	Planner Checklist	# of Copies	SITE PLAN SUBMISSIONS CHECKLIST (* If applicant chooses to submit a Preliminary Plan, then the * items were submitted for that phase and only updates are required)
X		1	* Boundary Survey meeting the requirements of Section 13 of the City of Portland's Technical Manual
X		1	Final Site Plans including the following:
X			Existing and proposed structures, as applicable, and distance from property line (including location of proposed piers, docks or wharves if in Shoreland Zone);
X			Existing and proposed structures on parcels abutting site;
X			All streets and intersections adjacent to the site and any proposed geometric modifications to those streets or intersections;
X			Location, dimensions and materials of all existing and proposed driveways, vehicle and pedestrian access ways, and bicycle access ways, with corresponding curb lines;
X			Engineered construction specifications and cross-sectional drawings for all proposed driveways, paved areas, sidewalks;
X			Location and dimensions of all proposed loading areas including turning templates for applicable design delivery vehicles;
N.A.			Existing and proposed public transit infrastructure with applicable dimensions and engineering specifications;
X			Location of existing and proposed vehicle and bicycle parking spaces with applicable dimensional and engineering information;
X			Location of all snow storage areas and/or a snow removal plan;
N.A.			A traffic control plan as detailed in Section 1 of the Technical Manual;
N.A.			Proposed buffers and preservation measures for significant natural features, where applicable, as defined in Section 14-526(b)(1);
N.A.			Location and proposed alteration to any watercourse;
N.A.			A delineation of wetlands boundaries prepared by a qualified professional as detailed in Section 8 of the Technical Manual;
N.A.			Proposed buffers and preservation measures for wetlands;
X			Existing soil conditions and location of test pits and test borings;
X			Existing vegetation to be preserved, proposed site landscaping, screening and proposed street trees, as applicable;
X			A stormwater management and drainage plan, in accordance with Section 5 of the Technical Manual;
X			Grading plan;
N.A.			Ground water protection measures;
X			Existing and proposed sewer mains and connections;
X			Location of all existing and proposed fire hydrants and a life safety plan in accordance with Section 3 of the Technical Manual;
X			Location, sizing, and directional flows of all existing and proposed utilities within the project site and on all abutting streets;

- Continued on next page -

N.A.		Location and dimensions of off-premises public or publicly accessible infrastructure immediately adjacent to the site;
X		Location and size of all on site solid waste receptacles, including on site storage containers for recyclable materials for any commercial or industrial property;
X		Plans showing the location, ground floor area, floor plans and grade elevations for all buildings;
N.A.		A shadow analysis as described in Section 11 of the Technical Manual, if applicable;
N.A.		A note on the plan identifying the Historic Preservation designation and a copy of the Application for Certificate of Appropriateness, if applicable, as specified in Section Article IX, the Historic Preservation Ordinance;
X		Location and dimensions of all existing and proposed HVAC and mechanical equipment and all proposed screening, where applicable;
X		An exterior lighting plan in accordance with Section 12 of the Technical Manual;
N.A.		A signage plan showing the location, dimensions, height and setback of all existing and proposed signs;
X		Location, dimensions and ownership of easements, public or private rights of way, both existing and proposed.



**PORTLAND FIRE DEPARTMENT
SITE REVIEW
FIRE DEPARTMENT CHECKLIST**



A separate drawing[s] shall be provided as part of the site plan application for the Portland Fire Department's review.

1. Name, address, telephone number of applicant
2. Name address, telephone number of architect
3. Proposed uses of any structures [NFPA and IBC classification]
4. Square footage of all structures [total and per story]
5. Elevation of all structures
6. Proposed fire protection of all structures
 - **As of September 16, 2010 all new construction of one and two family homes are required to be sprinkled in compliance with NFPA 13D. This is required by City Code. (NFPA 101 2009 ed.)**
7. Hydrant locations
8. Water main[s] size and location
9. Access to all structures [min. 2 sides]
10. A code summary shall be included referencing NFPA 1 and all fire department. Technical standards.

Some structures may require Fire flows using annex H of NFPA 1

**IMMUCELL CORPORATION
BUILDING ADDITION
APPLICATION FOR SITE PLAN REVIEW
CITY OF PORTLAND PLANNING DEPARTMENT
PORTLAND, MAINE
Project No. 14326**

May 22, 2014

DESCRIPTION

Immucell Corporation is a light industrial business, producing livestock related food products, and biotechnical supplies. The existing two-story manufacturing facility, located on Lot 3 in the Evergreen Industrial Park off Riverside Street, is housed in a 23,583 sq.ft. building, comprised of the following uses:

-Existing Office Use	3781 sq.ft.
-Existing Storage/Mechanical	3093 sq.ft.
-Existing Unfinished/Open Area	5050 sq.ft.
-Existing Manufacturing Use	11,659 sq.ft.

The proposed two-story 7,290 sq.ft. building addition, consisting of storage and loading area, will bring the total building area to approximately 30,873 sq.ft.

On the site, the developed areas are primarily truck maneuvering drives and employee paved parking. Approximately 3,360 sq.ft. of new bituminous pavement will be added, including relocation of 8 parking spaces and addition of 7 spaces. The parking count on site will increase from 32 spaces to 39 spaces. The renovation of the truck yard will also remove approximately 2490 sq.ft. of existing impervious gravel and replace it with grass.

Since all of the new building and most of the new pavements are replacing existing impervious surfaces, the total increased impervious surface following construction will be only approximately 870 sq.ft.

Property

Owner/developer is: Immucell Corporation
56 Evergreen Drive
Portland, ME 04103
Contact: Michael Brigham
Tel. 207-878-2770

Zone:	Industrial – IM
Lot size:	1.39 Acres
Soil Type:	Scantic Silt Loam (SCS mapping)
Net Impervious Increase:	870 s.f.
Impervious Site Ratio:	71.2% (75% Allowed)
Building Height:	26 ft. (75 ft. Allowed)
Front Setback:	125 ft. (25 ft. Required)

Side Setback: 35 ft. (25 ft. Required)
Rear Setback: 30 ft. (25 ft. Required)

SEC. 14-527.g. LEVEL II FINAL WRITTEN STATEMENTS

1. Construction management plan. Anticipated Construction Schedule:

July 1, 2014: Erect silt fencing and catch basin filter sacks downslope of earthwork areas. Begin removal of existing pavements, and begin earthwork for building addition. Provide stone construction exit.

July 15, 2014: Install underground utilities and storm drainage system. Re-grade site and vehicle maneuvering areas. Complete building foundation, and begin erecting structure.

July – Sept. 2014: Provide erosion control and dust control throughout the summer.

Sept. 1, 2014: Complete paving on truck dock area and relocated parking.

Sept. 15, 2014: Finish loaming and seeding all grass areas. Plant landscaping materials. Clean and maintain silt fence and erosion control measures throughout the site.

Oct. 17, 2014: Complete building addition, install equipment, and begin occupancy.

Oct. 31, 2014: Clean-up around site; repair disturbed areas with seed and heavy winter mulch. Remove erosion control measures where stabilization is complete.

2. Transportation Standards: There is no significant change in site traffic anticipated due to this small building addition. A maximum of five additional employees are planned for this expansion, and no additional truck traffic is expected. Approximately five truck deliveries per month are expected. There is therefore, no need for a traffic study.

Sidewalk: A Waiver is requested from the City requirement for a sidewalk to be placed along the Evergreen Drive frontage. The industrial park was developed with no sidewalks, since there is no expectation for pedestrian access. Also, the strip along the street right-of-way, on both sides of the property line, is a vegetated drainage channel, that is a major component of the street and site drainage system.

Filling-in this channel for the construction of a sidewalk would incur major storm drainage system reconfiguration and expense.

Loading Area: The truck loading dock will be oriented to face the street, rather than the side property line as current. This will allow better access without exiting over the neighbor's driveway to the south. Small daily delivery trucks can drive onto the lot, then back up to the loading dock. Larger trucks and tractor-trailers will need to back straight in from the street, since there is not sufficient turning radius on-site. All trucks then will be able to exit straight out through the existing south driveway.

Parking: Of the existing 32 parking spaces currently on the site, eight of the spaces on the southeast side will be moved slightly easterly to allow better truck access. An additional 7 paved spaces will be added to the parking strip to raise the total to 39 spaces on the site. The City ordinance requires 10 spaces for Office Use(3781 s.f./ 400s.f.) plus 28 spaces for Manufacturing Use(27,092 s.f./ 1000s.f.) = 38 spaces. One additional space is being provided for employee and visitor use.

Bicycle Parking: A bicycle rack for securing a minimum of 8 bicycles will be placed near the front of the site, in an existing impervious area. The City ordinance requires 2 bicycle spaces for every ten automobile spaces($39 \text{ space}/10 \times 2 = 8$ spaces).

3. On this small 1.39-acre industrial park lot there are no known significant natural features or habitats. The lot is almost entirely developed with building, pavement, and mowed lawns. The grassed drainage easements to the north and east of the building will continue to channel the storm runoff to the existing drainage swales to the northeast.
4. For drainage and storm water narrative and design, see attached Storm Water Management section.
5. For drainage and storm water narrative and design, see attached Storm Water Management section.
6. No known City Master Plan is available for this industrial site.
7. The proposed building addition will require additional capacity from the following utility services:
 - Water: See attached letter to Portland Water District.
 - Sewer: See attached letter to Portland Public Services.
8. The proposed building addition will add approximately 2 cubic yards of recycled cardboard each month. One recycling container for cardboard will be located beside the trash dumpster, in front of the new addition in the paved truck maneuvering area. The dumpsters will be in a fenced enclosure, screened from view from Evergreen

Drive, and screened from the easterly neighboring industrial building by a row of new evergreen trees.

9. NFPA 1 code summary and City Fire Department standards. See drawings A1 and F1 for code summary.
10. Section 14-526 design standards relating to transportation are discussed in #2 above.

Lighting:

The existing site is lit from wall-pack lights on the building. Additional wall-pack lights will be added to the new building addition. These fixtures will have cut-off features, as shown on the data sheets attached in the Lighting section.

11. Additional HVAC equipment for this building addition meets applicable emissions standards, according to the manufacturers.
12. No State or Federal regulatory permits are needed for this small addition. This small 1.39-acre total parcel is far below the DEP Site Location Permit threshold of 3-acre impervious; and the total impervious area addition of 870 s.f. since 2005, is far below the DEP Stormwater Permit threshold of 1-acre. There will be no disturbance of wetlands or streams, which could trigger a DEP and Army Corp Wetland or NRPA Permit.
13. **Financial Capacity:** Immucell Corporation intends to fund the project through its 'Cash and Investments' account, which was \$5,472,000 at the end of March this year. A letter of commitment from Immucell is attached in the Financial Capacity section.
Technical Capacity: Immucell Corporation owns and operates the existing manufacturing building and site facilities on their lot, and this proposed manufacturing addition will be operated by the same staff.
14. Along the northeasterly property line is an existing City of Portland drainage easement; and along the southeasterly property line is an existing City of Portland drainage and sewerline easement. There will be no significant changes to these easements, that will affect their continued use as easements. The northeasterly easement will be re-vegetated where there is currently gravel; and the southeasterly easement will have a shallow vegetated storm water filter swale and new evergreen screen plantings installed. No new easement will be created.

ATTACHMENTS

1. RIGHT, TITLE, & INTEREST
2. FINANCIAL CAPACITY
3. WATER AND SEWER DEPARTMENT LETTERS
4. STORM WATER MANAGEMENT
5. SOILS
6. SITE LIGHTING
7. HVAC EQUIPMENT EMISSIONS

RIGHT, TITLE, & INTEREST

MORTGAGE DEED, SECURITY AGREEMENT AND FINANCING STATEMENT

IMMUCELL CORPORATION, a Delaware Corporation

to

CONFIDENTIAL

PEOPLES HERITAGE SAVINGS BANK

KNOW ALL MEN BY THESE PRESENTS, that IMMUCELL CORPORATION, a Delaware Corporation, with a mailing address of 56 Evergreen Drive, Portland, Maine 04103 (the "Grantor"), in consideration of One Dollar (\$1.00) and other valuable consideration paid by PEOPLES HERITAGE SAVINGS BANK, a savings bank duly organized and existing by law and having a place of business at One Portland Square, Portland, Maine, with a mailing address of P.O. Box 9540, Portland, Maine 04112-9540 (the "Grantee"), the receipt whereof is hereby acknowledged, does hereby give, grant, bargain, sell and convey unto the said PEOPLES HERITAGE SAVINGS BANK, its successors and assigns, forever, the following described parcels of real estate:

A certain lot or parcel of land situated in the City of Portland, County of Cumberland and State of Maine, more particularly described in Schedule A attached hereto and incorporated herein.

Together with all buildings, fixtures and improvements now or hereafter situated thereon, including without limitation, all plumbing, electrical, heating, ventilating, air conditioning, and all other building components, machinery and equipment.

Also hereby conveying all of the Grantor's right, title and interest in and to the fee underlying all public or private rights-of-way, easements, streets and alleys over, contiguous, benefiting or appurtenant to the Premises conveyed hereby.

(All of the above are collectively referred to herein as the "Premises").

As additional security for payment and performance of the Obligations (as hereinafter defined), covenants and agreements secured hereby, Grantor hereby transfers, assigns and grants a security interest to Grantee in:

a) All rents, profits, revenues, receipts from site charges, royalties, rights and benefits under any and all leases or tenancies now existing or hereafter created of the Premises or any part thereof and all deposits granted to secure the tenants' performance thereunder, with the right to receive and apply the same to the Obligations secured hereby, and Grantee may demand, sue for and recover such payments, but shall not be required to do so; provided, however, that so long as Grantor is not in Default hereunder, as hereinafter defined, the right to

Cumberland County Registry of Deeds
2.k 11068 Page 95

9

receive and retain such rents, profits and income is reserved to Grantor. To carry out the foregoing, Grantor agrees to execute and deliver to Grantee such assignments of leases and rentals applicable to the Premises as the Grantee may from time to time request, while this Mortgage and the Obligations are outstanding. Nothing herein shall obligate Grantee to perform the duties of Grantor as landlord or lessor under any such leases or tenancies, which duties Grantor hereby covenants and agrees to well and punctually perform. Following default by Grantor in its Obligations (hereafter defined) to Grantee, Grantee may, subject to any applicable notice and/or cure provision, in person or by agent, with or without bringing any action or proceeding, or by a receiver appointed by a court which Grantee shall be entitled to have appointed, take possession of the Premises and have, hold, manage, lease and operate the Premises on such terms and for such period of time as Grantee may deem proper, and to apply such rents, income and profits to the payment of:

- i) All expenses of managing the Premises; and
- ii) The Obligations, together with all costs and attorneys fees of Grantee.

The exercise by the Grantee of the rights provided above shall not be considered a waiver of any default by the Grantor under the obligations, or an election of remedies of Grantee, all of which shall be cumulative;

b) All judgments, awards of damages and settlements hereafter made as a result or in lieu of any taking of the Premises or any interest therein or part thereof under the power of eminent domain, or for any damage (whether caused by such taking or otherwise) to the Premises, or the improvements thereon or any part thereof, including any award for change of grade of streets. Grantee may apply all such sums or any part thereof so received to the Obligations secured hereby in such manner as it elects or, at its option, the entire amount, or any part thereof so received, may be released. Grantor hereby irrevocably authorizes and appoints Grantee as Grantor's attorney-in-fact to collect and receive any such judgments, awards and settlements from the authorities or entities making the same, to appear in any proceeding therefor, to give receipts and acquittances therefor, and to apply the same to payment on account of the Obligations secured hereby, whether then matured or not; and the Grantor will execute and deliver to the Grantee on demand such assignments and other instruments as the Grantee may require for said purposes and will reimburse the Grantee for its costs (including reasonable counsel fees) in the collection of such judgments and settlements.

c) All goods and items of personal or real property which are now or may hereafter become, fixtures upon or with respect to the Premises;

d) All construction and building materials, supplies, lumber, hardware or other items of personal property which are now or may hereafter become, affixed to or a part of the Premises, whether as a part of the real property, or as a fixture;

e) All other equipment and machinery, now or hereafter affixed to or placed upon the Premises and necessary to the actual use and ownership of the real estate. Grantee does not have a security interest, as of this date, in the operating assets of Grantor.

Receipt of rents, awards, and any other monies or evidences thereof, pursuant to the provisions of the foregoing paragraphs (a) - (e) and any disposition of the same by Grantee shall not constitute a waiver of the right of foreclosure by Grantee in the event of Default or failure of performance by Grantor of any covenant or agreement contained herein or in any other instrument or agreement evidencing, securing, guaranteeing or governing the Obligations (the "Loan Documents"). The foregoing assignments shall not be deemed to waive, subordinate, or otherwise affect the priority of the lien of this Mortgage or the terms set forth hereinafter.

This Mortgage shall also serve as a FINANCING STATEMENT with respect to any and all fixtures of the Grantor (Debtor) whether now owned or hereafter acquired, which are or may become affixed to the above-described Premises. Information concerning this security interest in the fixtures may be obtained from the Grantee (Secured Party) at its offices listed at the commencement of this Mortgage; the mailing address of the Grantor (Debtor) is the address listed at the commencement of this Mortgage. Proceeds of all collateral (including insurance proceeds) are also covered, although no disposition of collateral by Grantor (Debtor) is thereby authorized.

(All of the above items are "Personal Property Collateral").

Grantee may exercise all of the remedies of a secured party under the Uniform Commercial Code as now in effect in the State of Maine, and such further remedies as may from time to time hereafter be provided in Maine for a secured party under this Mortgage Deed and Financing Statement. Grantor agrees that all rights and remedies of Grantee as to the Personal Property Collateral and as to the Premises, and all rights and interests appurtenant thereto, shall be cumulative and may be exercised together or separately without waiver by Grantee of any other of its rights or remedies. Grantor further agrees that any sale or other disposition by Grantee

of the Personal Property Collateral and any rights and interests therein or appurtenant thereto, or any part thereof, may be conducted either separately from or together with any foreclosure, sale or other disposition of the Premises, or any rights or interests therein or appurtenant thereto, or any part thereof, all as the Grantee may in its sole discretion elect.

TO HAVE AND TO HOLD the above granted Premises and Personal Property Collateral, with all the privileges and appurtenances to the same belonging, to said PEOPLES HERITAGE SAVINGS BANK, its successors and assigns, to its and their use and behoof forever;

PROVIDED NEVERTHELESS, that if Grantor, its successors, or assigns, pays or causes to be paid to Grantee, its successors or assigns, the principal sum of TWO HUNDRED TWENTY THOUSAND DOLLARS (\$220,000), plus interest, costs of collection, and other charges in accordance with a certain promissory note of even date, and any extensions, renewals or replacements of the foregoing, those obligations established under a certain commitment letter dated September 28, 1993, as accepted by the Grantor, under any other of the Loan Documents, and any and all other obligations and liabilities of the Grantor to Bank now existing or hereafter arising, howsoever created or evidenced; including, without limitation, all renewals, extensions or modifications or substitutions of any of the foregoing obligations, and shall repay when due any and all other advances which shall be made by Grantee to Grantor up to the overall principal amount of TWO HUNDRED TWENTY THOUSAND DOLLARS (\$220,000) plus interest and future advances necessary to protect the security and all expenses, if any, which are incurred in the collection of said note and advances, the enforcement of the Obligations and Loan Documents, and in the enforcement and foreclosure of this Mortgage, including reasonable attorneys' fees, which advances to protect the security shall be in addition to and not limited by said principal dollar amount, and until such payment performs all of Grantor's obligations, covenants and agreements contained herein and contained in said Note, commitment letter, or contained in any other of the Loan Documents (collectively the "Obligations"), then this Mortgage shall be void, otherwise shall remain in full force.

Grantor further covenants and agrees with Grantee as follows:

1. Payment and Performance. Grantor shall promptly pay and perform the Obligations secured hereby when due at the times and in the manner specified.

At its sole option the Grantee, its successors and assigns, may from time to time extend, renew, alter, and amend the Obligations secured hereby, provided, however, that the

total principal secured hereby and remaining unpaid, including any such principal advances, other than interest and advances to protect the security or to collect the Obligations, shall not at any time exceed as to principal the original principal sum ceiling set forth above. All provisions of this Mortgage shall apply to each further advance as well as to all other Obligations secured hereby regardless of whether the advance is specifically designated as being secured hereby. Nothing herein contained, however, shall limit the amount secured by this Mortgage if such amount is increased by advances made by Grantee, as herein elsewhere provided for, to protect the security or is increased by costs of collection.

2. Title. Grantor has good, marketable title to an indefeasible estate in fee simple in the Premises and good and marketable title to the Personal Property Collateral, free and clear of all liens and encumbrances, except as may have been specifically noted herein, and has good right and power to convey the Premises and Personal Property Collateral to Grantee to hold as aforesaid. This Mortgage is and will remain a valid and enforceable lien on the Premises and Personal Property Collateral, and Grantor shall and will Warrant and Defend the same to Grantee forever against the claims and demands of all persons, except as aforesaid.

3. Taxes and Assessments. Grantor shall promptly pay and discharge, when due, all taxes and assessments of every type or nature levied or assessed against the Premises and Personal Property Collateral, all water and sewerage charges, and any other governmental claim, obligation or encumbrance against the Premises and Personal Property Collateral which may be or become prior to this Mortgage, except as are being actively contested in good faith and by appropriate proceedings diligently pursued so as to prevent the ripening of any lien, and with adequate reserves established therefor. Upon request, Grantor shall deliver to Grantee receipts evidencing payment of any such taxes, assessments, charges and encumbrances.

4. Escrow. Upon written request therefor by Grantee to Grantor, which request may be made within Grantee's sole discretion, and which request may be withdrawn and remade from time to time, Grantor shall pay to Grantee on a monthly basis as hereinafter set forth a sum equal to the real estate taxes, assessments, and water and sewer charges next due on the Premises and Personal Property Collateral and all premiums next due for fire and other casualty insurance required of Grantor hereunder, less all sums already paid therefor, divided by the number of months to elapse not less than one (1) month prior to the date when due, to be held in an interest-bearing account. Grantor agrees that should there be insufficient funds so deposited with Grantee for said taxes, assessments, charges and premiums when due, it will upon demand by Grantee promptly pay to Grantee amounts necessary to make such payments in full; any surplus funds may be applied

CONFIDENTIAL

toward the payment of the Obligations secured by this Mortgage or credited toward such taxes, assessments, charges and premiums. Upon Default, the Grantee may apply such funds toward the payment of the Obligations without causing thereby a waiver of any rights, statutory or otherwise, and specifically such application shall not constitute a waiver of the right of foreclosure hereunder. Grantor hereby assigns to Grantee all the foregoing sums so held hereunder for such purposes.

5. Insurance. Grantor shall keep the Premises and Personal Property Collateral (including all building, improvements and fixtures) insured against loss or damage by fire, the perils against which insurance is afforded by the Extended Coverage Endorsement with vandalism and malicious mischief endorsements, and such other risks and perils as Grantee may require from time to time. The policy or policies of such insurance shall be in such form and shall be in such amounts as shall comply with all co-insurance requirements of such policies, and as Grantee may reasonably require, shall be issued by a company or companies licensed to do business in Maine by the Maine Superintendent of Insurance and approved by Grantee, and shall provide for Grantee as mortgagee/loss payee and shall provide at least thirty (30) days' notice of cancellation or change of coverage to Grantee. Whenever requested by Grantee, a duplicate copy of such policies or other reasonable proof of insurance shall be delivered immediately to Grantee. Any and all amounts received by Grantee under any of such policies may be applied by Grantee on the Obligations secured hereby in such manner as Grantee may, in accordance with law, elect, or, at the option of Grantee, the entire amount so received or any part thereof may be released.

6. Condition and Use of Premises. Grantor:

a) shall not remove or demolish nor alter the design or structural character of any building now or hereafter erected upon the Premises unless the Grantee shall first consent thereto in writing which consent shall not be unreasonably withheld;

b) shall maintain the Premises and Personal Property Collateral in good condition and repair;

c) shall not commit or suffer waste thereof; and

d) shall comply with all laws, ordinances, regulations, covenants, conditions and restrictions affecting the Premises, its operations, or any activities conducted on or about the Premises, and Personal Property Collateral and will not suffer or permit any violation thereof, by any other person or entity including any tenant or other party in possession.

CONFIDENTIAL

7. Financial Records. Grantor shall maintain full and accurate records and books of account in accordance with generally accepted accounting principles consistently applied, showing in detail the earnings and expenses of Grantor, and of the Premises and Personal Property Collateral and shall permit Grantee to examine the Premises and Personal Property Collateral and said books and records and all supporting vouchers and data any time and from time to time upon request; and Grantor hereby agrees to furnish to Grantee annual financial statements in such form as Grantee may require, together with such further financial and other information relating to the Grantor and the Premises and Personal Property Collateral as Grantee may require. Grantor shall provide the financial reports and information to Grantee as required and at the times set forth in the September 28, 1993 Commitment Letter from Grantee to Grantor.

8. Permitted Use. If at any time the then existing use or occupancy of the Premises and Personal Property Collateral shall, pursuant to any zoning or other law, ordinance or regulation, be permitted only so long as such use or occupancy shall continue, then Grantor shall not cause or permit such use or occupancy to be discontinued without the prior written consent of the Grantee.

9. Waivers. No delay by Grantee in exercising any right or remedy hereunder, or otherwise afforded by law, or by any other of the Loan Documents, shall operate as a waiver thereof or preclude the exercise thereof during the continuance of any default hereunder, and no waiver shall be effective unless in writing signed by the Grantee, nor serve as a waiver of the same or other default on any other occasion.

10. Modification of Security. Without affecting the liability of Grantor or any other person (except any person expressly released in writing) for payment or for performance of any of the Obligations, and without affecting the rights of Grantee with respect to any other security not expressly released or modified in writing, and without impairing the validity or priority of this Mortgage, Grantee may at any time and from time to time, either before or after the maturity of the Obligations without notice or consent:

a) Release or modify the liability of any person or of any other security for payment or performance of all or any part of the Obligations;

b) Extend the time or otherwise alter, increase or decrease the terms of payment or interest rate of all or any part of the Obligations or modify or waive any of the Obligations, or subordinate, release, modify or otherwise deal with the lien or charge hereof;

CONFIDENTIAL

c) Exercise or refrain from exercising or waive any right Grantee may have including, without limitation, the declaration of default under and foreclosure of this Mortgage without first exhausting other remedies or collateral or taking any other action against any other person;

d) Accept additional security of any kind; or

e) Release or otherwise deal with any other property, real or personal, securing the Obligations, including all or any part of the Premises and Personal Property Collateral.

11. Priority of Future Agreements. Any agreement hereafter made by Grantor and Grantee pursuant to this Mortgage shall be superior to the rights of the holder of any intervening lien or encumbrance to the extent allowed by law.

12. Additional Documents. Grantor at Grantor's expense will do, execute, acknowledge and deliver to Grantee such further deeds, acts, conveyances, mortgages, assignments, transfers, and all other documents and assurances as Grantee in its discretion may reasonably require from time to time to better establish and perfect the property interests and rights created or intended by Grantee to be created in accordance with the provisions of the September 28, 1993 Commitment Letter from Grantee to Grantor, as amended.

13. Transfers of Title. The Grantor herein shall not sell, convey, encumber or otherwise dispose of the Premises and Personal Property Collateral or any interest therein, either voluntarily or involuntarily, including without limitation, any lease with an option to purchase, bond for deed, purchase and sale contract coupled with transfer of possession or lease with a term of more than two (2) years, except with the prior written consent of the Grantee. This condition shall continue until all Obligations secured hereby are satisfied, and any permission given or election made not to foreclose or accelerate said Obligations by Grantee, its successors or assigns, as to any one such transfer, shall not constitute a waiver of any rights as to any subsequent transfer of title as to which this condition shall remain in full force and effect.

14. Environmental Matters. Grantor represents in response to inquiries from the Grantee, covenants and agrees as follows:

a) Grantor, the Premises and the Personal Property Collateral do now and shall at all times comply with the requirements of all present and future federal, state, and local statutes, regulations, ordinances, licenses, permits, agreements and orders ("Environmental Requirements")

CONFIDENTIAL

relating to environmental and land use matters, including, without limitation, the federal Comprehensive Environmental Response, Compensation and Liability Act, the federal Superfund Amendments and Reauthorization Act of 1986, and the Maine Uncontrolled Hazardous Substance Sites Act, as any of them may be amended or supplemented from time to time, and Grantor has received no notice (directly or indirectly) from any governmental agency or from any other party of alleged noncompliance with Environmental Requirements;

b) In its sole discretion, Grantee may, but shall not be required to, discharge any environmental lien or encumbrance, or make advances for the purpose of complying with any Environmental Requirements, or directly undertake environmental studies, clean-up, removals, or remedial work with respect to the Premises or Personal Property Collateral; all such expenses and advances shall be deemed advances necessary to protect the security and shall be a part of the Obligations secured hereby; Grantor hereby covenants and agrees promptly upon demand to reimburse, indemnify and hold Grantee harmless on account of any such claims, expenses and advances, including costs and reasonable attorneys' fees incurred in the enforcement and collection of this right, which shall be added to the Obligations;

c) Grantee shall have no responsibility to monitor (or to continue to monitor once undertaken) the compliance of Grantor, or any party claiming through Grantor, with any Environmental Requirements; no relationship shall exist between Grantor and Grantee except mortgagor-borrower and mortgagee-lender; and

d) Grantor agrees to promptly notify Grantee in writing of any direct or indirect receipt by Grantor of any notice of any alleged or threatened violation of any Environmental Requirements or any related legal proceedings involving the Grantor, Premises or Personal Property Collateral, or the occurrence of any accident, event or condition that constitutes a likely violation of any Environmental Requirements.

15. Events of Default. Subject to the fifteen (15) day grace period for payment defaults and the thirty (30) day notice and cure requirement for nonpayment defaults, as set forth in the Note secured hereby, this Mortgage and the Obligations secured hereby shall, at the option of the Grantee herein, become immediately due and payable upon any one or more of the following events of default (referred to herein as a "Default"):

CONFIDENTIAL

- a) Default in the prompt payment or performance of the Obligations or any other obligation, liability or covenant of Grantor to Grantee, whether or not secured hereby or established hereunder, or the obligation of any endorser, guarantor or surety for any of the Obligations or demand by Grantee under the terms of any demand note secured hereby or given by the Grantor to the Grantee;
- b) Grantor's failure or neglect to perform, keep or observe any material term, provision, condition, covenant, warranty or representation contained in this Mortgage or in any other of the Loan Documents which is required to be performed, kept or observed by Grantor;
- c) If any representation, statement, report or certificate made or delivered by Grantor, or by any maker, partner, principal or guarantor for the Obligations is false or incorrect in any material respect when made or delivered, or if Grantor fails to furnish financial information or permit inspections as provided in this Mortgage;
- d) If any attachment, trustee process, lien, execution, levy, injunction, or receivership is issued or made against the Grantor or the Premises and Personal Property Collateral and is not removed within sixty (60) days or if any final judgment and execution issued against Grantor remains unsatisfied;
- e) If Grantor fails to pay any tax, assessment, sewer or water charge on the Premises and Personal Property Collateral, as provided herein, or fails to maintain any insurance policy the Grantor is required to provide to or for the benefit of the Grantee;
- f) If Grantor fails to maintain the Premises and Personal Property Collateral in good condition and repair, or permits or suffers any waste thereof;
- g) The entry of a decree or order for relief with respect to the Grantor in an involuntary case under the federal bankruptcy laws, as now or hereafter constituted, or any other applicable federal or state bankruptcy, insolvency or other similar law, or appointing a receiver, liquidator, trustee, custodian (or similar official) of the Grantor, or ordering the winding-up or liquidation of its affairs which is not promptly contested and released or discharged within sixty (60) days;
- h) The commencement by the Grantor of a voluntary case under the federal bankruptcy laws, as now constituted or hereafter amended, or any other applicable federal or state bankruptcy, insolvency or other similar law, or the consent by Grantor to the appointment of or taking possession by a receiver, liquidator, trustee, custodian (or other similar

official) of the Grantor or for any substantial part of its property, or the making by Grantor of any assignment for the benefit of creditors, or the insolvency or the failure of the Grantor generally to pay its debts as such debts become due, or the taking of action by the Grantor in furtherance of any of the foregoing;

i) The sale, conveyance, encumbrance or other disposition of the Premises and Personal Property Collateral or any interest therein either voluntarily or involuntarily, including without limitation any lease with an option to purchase, bond for deed, purchase and sale contract coupled with transfer of possession, or lease with a term of more than two (2) years excepting, however, condemnation or eminent domain proceedings or as otherwise expressly permitted herein;

j) Loss or destruction of or substantial damage to any of the Premises and Personal Property Collateral; or

k) If the Grantee in good faith deems itself insecure because the value of the Premises and Personal Property Collateral, or the priority of this Mortgage, is impaired.

16. Powers Upon Default. Subject to the fifteen (15) day grace period for payment defaults and the thirty (30) day notice and cure requirement for nonpayment defaults, as set forth in the Note secured hereby, upon the occurrence of any Default or at any time thereafter, Grantee may, at its option, do any one or more of the following, all of which are hereby authorized by Grantor:

a) Declare the Obligations immediately due and payable;

b) Cease advancing money or extending credit to or for the benefit of the Grantor under any agreement, whether or not secured hereby;

c) Foreclose this Mortgage under any legal method of foreclosure in existence at the time or now existing, or under any other applicable law, including, without limitation, the Statutory Power of Sale;

d) Exercise all of the remedies of a secured party under the Uniform Commercial Code as now in effect in the State of Maine, and such further remedies as may from time to time hereafter be provided in Maine for a secured party. Grantor agrees that all rights of Grantee as to Personal Property Collateral and as to the Premises, and rights and interest appurtenant thereto, may be exercised together or separately and in such order as the Grantee may elect. Grantor further agrees that in exercising its power of sale as to the Personal Property Collateral and rights and interest

CONFIDENTIAL

appurtenant thereto, the Grantee may sell such Personal Property Collateral or any part thereof, either separately from or together with the said Premises, and rights and interests appurtenant thereto, or any part thereof, all as the Grantee may in its discretion elect. In particular, the Grantee may proceed to enforce rights against, seek the replevin of, and/or sell Personal Property Collateral prior to or during the pendency of any real estate foreclosure proceeding, redemption period, or foreclosure sale without waiving any such foreclosure;

e) Enter upon and take possession of the Premises and Personal Property Collateral or any part thereof and exclude the Grantor, its agents, managers and servants, and to perform any acts Grantee deems necessary or proper to conserve the security, and to collect and receive all rents, security deposits, profits, revenues, proceeds and profits thereof, including those past due as well as those accruing thereafter, and use, manage, operate and control the Premises and Personal Property Collateral, and Grantee shall be entitled to have a receiver appointed to enter and take possession of the Premises and Personal Property Collateral, collect the rents, security deposits, proceeds and profits therefrom and apply the same as the court may direct. The expense (including receiver's fees, counsel fees, costs and agent's compensation) incurred pursuant to the powers herein contained shall be added to the Obligations secured hereby. Grantee shall (after payment of all costs and expenses incurred) apply such rents, issues and profits received by it on the Obligations in such order as Grantee determines; and Grantor agrees that exercise of such rights and disposition of such funds shall not constitute a waiver of any foreclosure once commenced nor preclude the later commencement of foreclosure for breach hereof. The right to enter and take possession of said property and to collect the rents, issues and profits thereof, whether by a receiver or otherwise, shall be cumulative to any other right or remedy hereunder or afforded by law, and may be exercised concurrently therewith or independent thereof. Grantee shall be liable to account only for such rents, security deposits, proceeds and profits as are actually received by Grantee;

f) Sell or otherwise dispose of the Premises and Personal Property Collateral (in its then condition or after repair, further construction and/or preparation thereof, utilizing in connection therewith any of Grantor's assets, without charge or liability to Grantee therefor) at foreclosure sale (which sale Grantee may postpone from time to time to the extent permitted by law), all as Grantee deems advisable, for cash or credit; provided, however, that Grantor shall be credited with the net proceeds of such sale only when such proceeds are finally collected by Grantee and the Grantor shall pay any deficiency on demand. Grantee may become the

CONFIDENTIAL

purchaser at any such sale and Grantee may, in lieu of actual payment of the purchase price, offset the amount thereof against the Obligations;

g) Use or transfer, without charge or liability to Grantee therefor, any of Grantor's surveys, engineering plans, and other real estate related documentation, licenses or permits in advertising for sale and selling of the Premises and Personal Property Collateral;

h) Grantor recognizes that in the event Grantor defaults, no remedy of law will provide adequate relief to Grantee, and therefore Grantor agrees that Grantee shall be entitled to temporary and permanent injunctive relief to cure any such Default without the necessity of proving actual damages.

All of Grantee's aforesaid rights and remedies are cumulative and non-exclusive.

17. Expenses. The Grantor shall pay to or reimburse the Grantee on demand and as a part of the Obligations secured hereby any and all expenses, including without limitation reasonable counsel fees and expenses, incurred or paid by the Grantee in connection with the preparation, execution, administration, interpretation, review, preservation, collection or enforcement of this Mortgage Deed and Security Agreement, the Loan Documents, the Premises and Personal Property Collateral or the Obligations. Such expenses to be paid or reimbursed include without limitation those incurred in the preparation for (whether commenced or not), or the conduct of, any litigation, contest, dispute, suit or proceeding (whether initiated by Grantee, Grantor or any other party) to protect, collect, enforce, sell, take possession of or liquidate any of the Premises and Personal Property Collateral, to enforce any rights of Grantee against Grantor or against any other person, and those expenses incurred by Grantee in defending, settling or satisfying any claim, action or demand asserted by any person or entity, including any receiver, trustee, creditor's committee or debtor-in-possession in any bankruptcy or reorganization, any assignee or assignee-for-the-benefit-of-creditors, creditor, or by any other person, whether in connection with the Grantor, the Obligations or any documents, transaction or Collateral related thereto, and whether relating to any alleged theory of preference, fraudulent conveyance, subordination, usury, ultra vires, invalidity, interference, control, misrepresentation, conspiracy, or similar theory, or otherwise.

18. Advances to Protect Security. At its option, and without limiting any other right or remedy, Grantee may pay or discharge taxes, liens, security interests or other encumbrances at any time levied against or placed on the

Premises or Personal Property Collateral, and may procure and pay any premiums on any insurance policy covering the Premises or Personal Property Collateral or any risks related thereto, or provide for the maintenance and preservation of any of the Premises of Personal Property Collateral, and add the expense thereof to the Obligations secured hereby. Any and all such amounts, costs or expenses paid or incurred by Grantee, shall be added to the Obligations secured hereby as advances to preserve Grantee's security and shall bear interest from the date of payment by Grantee therefor at the highest rate of interest payable pursuant to any instrument or other evidence of indebtedness secured hereby, as the same may vary, or if none, then at the rate of interest applicable to judgments or courts of the State of Maine pursuant to Title 14 Maine Revised Statutes Section 1602-A, as the same may be amended.

19. Waivers. The Grantee may exercise its rights against the Premises and Personal Property Collateral without resort or regard to any other collateral or sources of reimbursement for liability. The Grantee shall not be deemed to have waived any of its rights under or against this Mortgage or any other of the Loan Documents or otherwise unless such waiver be in writing and signed by the Grantee. Grantee's failure to require strict performance of the terms, covenants and agreements of this Mortgage or any other of the Loan Documents, or any delay or omission on the part of the Grantee in exercising any right, or any acceptance of partial or inadequate payment or performance shall not waive, affect or diminish such right or Grantor's duty of compliance and performance therewith. A waiver on any one occasion shall not be construed as a bar to or waiver of the same or any other right on the same or any future occasion. All rights and remedies of the Grantee under this Mortgage or any other of the Loan Documents shall be cumulative and may be exercised singularly or concurrently. Any note which this Mortgage may secure is a separate instrument and may be negotiated, extended or renewed by the Grantee without releasing the Grantor or any guarantor or co-maker.

20. Application of Payment. Grantor irrevocably waives the right to direct the application of any and all payments at any time or times hereafter received by Grantee from Grantor, or from any other source, and Grantor does hereby irrevocably agree that Grantee shall have the continuing exclusive right to apply and reapply any and all payments received at any time or times hereafter against the Obligations hereunder in such manner as Grantee may deem advisable.

21. Section Titles. The section titles contained in this Mortgage are for convenience only and shall not affect the construction or meaning of this Mortgage.

22. Miscellaneous.

a) Wherever in this Mortgage there is reference made to any of the parties hereto, such reference shall be deemed to include, wherever applicable, a reference to the successors, heirs and assigns of such party. The provisions of this Mortgage shall be binding upon and shall inure to the benefit of the successors, legal and personal representatives, heirs and assigns of Grantor and Bank. Wherever used, the singular shall include the plural, and the plural the singular, and the use of any gender shall be applicable to all genders, as the context or the identity of the Grantor may require. All Obligations of multiple Grantors shall be joint and several.

b) All representations and warranties of Grantor, and all conditions precedent to be performed by Grantor as set forth in the Loan Documents shall be true and satisfied at the time of the execution of this Mortgage, and shall survive the closing hereof and the execution and delivery of this Mortgage.

c) This Mortgage shall be construed in all respects in accordance with, and governed by, the laws of the State of Maine. Wherever possible each provision of this Mortgage shall be interpreted in such manner as to be effective and valid under applicable law, but if any provisions of this Mortgage shall be prohibited by or invalid under applicable law, such provision shall be ineffective to the extent of such prohibition or invalidity, without invalidating the remainder of such provision or the remaining provisions of this Mortgage.

d) This Mortgage may not be altered or amended except by an agreement in writing signed by both Grantor and Bank.

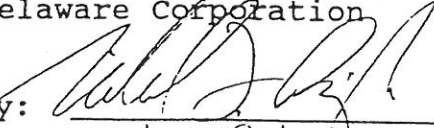
e) This Mortgage shall take effect as a sealed instrument.

IN WITNESS WHEREOF, the said IMMUCCELL CORPORATION has caused this instrument to be signed in its corporate name, intending this instrument to take effect as if under seal, by Michael F. Brigham CFO + Treasurer thereunto duly authorized this 3 day of November, 1993.

SIGNED, SEALED AND DELIVERED
In The Presence Of:



IMMUCCELL CORPORATION, a
Delaware Corporation

By: 

CFO + Treasurer

CONFIDENTIAL

STATE OF MAINE
CUMBERLAND, SS.

Nov 3, 1993

Personally appeared the above-named MICHAEL F. BRIGHAM
CFO & TREASURER of said IMMUCELL CORPORATION and
acknowledged the foregoing instrument to be his free act and
deed in his said capacity and the free act and deed of said
IMMUCELL CORPORATION.

Before me,



Notary Public/Attorney-at-Law
Name: CHRISTOPHER NEAGLE

4450.1/16T
39030/93123
11/03/93

CONFIDENTIAL

SCHEDULE A

A certain lot or parcel of land, together with the buildings and improvements thereon, located on the northeast side of Evergreen Drive in the City of Portland, County of Cumberland and State of Maine, further described as follows:

Lot 3, as shown on a plan named "Evergreen Industrial Park", dated November 2, 1984 and prepared by Land Use Consultants, and recorded in the Cumberland County Registry of Deeds in Plan Book 146, Page 57, to which plan reference is hereby made for a more particular description of Lot 3, which is further described as follows:

Beginning at an iron bar set on the southwest boundary of land conveyed to Robert Mitchell Co., Inc. by deed recorded in Book 4806, Page 108, which iron bar is located S 41' 04' 09" E and 435 feet from an iron bar set at the assumed southeast side of Riverside Street and west corner of the land of Mitchell;

Thence S 41' 04' 09" E, along the land of Mitchell, 278.01 feet to an iron bar at the north corner of Lot 4 on the plan described above;

Thence S 52' 30' W, along Lot 4 and other land of the Grantor, 244.35 feet to an iron bar on the northeast side of Evergreen Drive;

Thence northwest along Evergreen Drive on a curve to the left having a radius of 425 feet, an arc distance of 200 feet to an iron bar at the south corner of Lot 2;

Thence N 35' 16' 35" E, along Lot 2, 287.01 feet to the iron bar at the point of beginning.

Containing 1.39 acres, more or less, as shown on the subdivision plan described above.

SUBJECT HOWEVER, to the following:

1. Drainage and sewer easement given to the City of Portland dated March 10, 1968 and recorded in Book 7103, Page 202.
2. Utility pole easement given to Central Maine Power Company and New England Telephone and Telegraph Company dated September 16, 1987 and recorded in Book 8352, Page 305.

CONFIDENTIAL

3. Thirty foot wide private drainage easement along the northeast side of Lot 3 as shown on the plan described above.

Meaning and intending to convey, and hereby conveying, the same premises conveyed to the Grantor herein by Deed of Passive Power Products, Inc. by Deed of even or recent date recorded in the Cumberland County Registry of Deeds.

4450.18T

RECORDED
CUMBERLAND COUNTY
REGISTER OF DEEDS
NOV 11 1980

60570

PAID

7-3-02

PEOPLES HERITAGE BANK

NOTE

\$480,000

May 6, 1998

CONFIDENTIAL

FOR VALUE RECEIVED, the undersigned Maker promises to pay to the order of PEOPLES HERITAGE BANK the principal sum of Four Hundred Eighty Thousand Dollars (\$480,000) (or so much thereof as may be advanced from time to time) together with interest thereon:

- for the initial five (5) year portion of the term hereof at a fixed interest rate of Eight and One-Half Percent (8.5%) per annum; *and thereafter*
- at a fixed rate of interest equal to the Lender's cost, as of the date five (5) years from the date hereof, of borrowing funds from the Federal Home Loan Bank, plus Three Percent (3%) per annum.

Equal consecutive monthly payments of principal and interest in the amount of Four Thousand Seven Hundred Sixty-One Dollars and Sixty-Nine Cents (\$4,761.69) each, shall be payable, commencing on June 6, 1998 and continuing on the same day of each month thereafter until May 6, 2008 ("Maturity Date"), when all Amounts Owing Hereunder shall be due and payable in full. Lender reserves the right to adjust the amount of the monthly principal and interest payments, at the time of the interest rate adjustment, to reflect the change in interest rate, if any, and to generally preserve a hypothetical fifteen (15) year amortization schedule commencing on the date hereof, provided, however, that this shall not be deemed to extend the Maturity Date.

DEFINITIONS. As used herein the following terms shall have the meanings assigned:

- "Amounts Owing Hereunder" shall mean the entire outstanding principal balance of this Note; all accrued, unpaid interest; and all charges and expenses payable by the Maker to Lender under the Loan Documents, including, without limitation, all unpaid Prepayment Fees, Late Payment Fees and Default Interest, if any.
- "Lender" shall mean PEOPLES HERITAGE BANK, its successors and assigns, including any subsequent holder hereof.
- "Loan Document(s)" shall mean this Note, any other debt instrument of the Maker held by Lender, and all other agreements, documents or writings evidencing, governing or securing the indebtedness and obligations of the Maker to Lender, including, without limitation, all guaranties and security therefor.
- "Maker" shall mean IMMUCELL CORPORATION, a Delaware corporation.
- "Parties Liable Herefor" shall mean the Maker and any guarantor, indorser, accommodation party or other surety hereafter arising. All undertakings and obligations of Parties Liable Herefor shall be joint and several.

PREPAYMENT PREMIUM. All unscheduled partial or full prepayments of principal hereunder are subject to the obligation of all Parties Liable Herefor to pay to the holder hereof a prepayment premium in the amount of Five Percent (5%) of the principal amount prepaid during the first year of the term hereof, Four Percent (4%) of the principal amount prepaid

during the second year of the term hereof, Three Percent (3%) of the principal amount prepaid during the third year of the term hereof, Two Percent (2%) of the principal amount prepaid during the remainder of the term hereof. All prepayment premiums hereunder shall be due and payable to Lender in all cases of prepayment, whether voluntary or involuntary, including, without limitation, any prepayment arising in connection with the refinancing of this Note whether by Lender or any other party, and whether or not the result of default or acceleration, or collection or enforcement activities of Lender. The Maker hereby acknowledges and agrees that the prepayment premium is neither a penalty nor a form of liquidated damages, but is rather a negotiated element of the borrowing contract entered into herein by the Maker, as a necessary inducement to Lender to make the loan evidenced by this Note. *Notwithstanding the foregoing*, no prepayment premium shall be payable as a result of prepayment in connection with a bona fide, arm's-length sale, to an unrelated party, of premises of the Maker at 56 Evergreen Drive, Portland, Maine.

LATE PAYMENT FEE. If any agreed payment is not received within fifteen (15) days of when due, then all Parties Liable Herefor shall be liable to Lender for a late payment fee of Six Percent (6.0%) of the total amount of such delinquent payment, to be assessed at the option of Lender at any time while any balance remains outstanding hereunder.

DEFAULT INTEREST RATE. Lender shall have the right to charge interest on the unpaid principal balance hereof at an interest rate Three Percent (3%) per annum in excess of the rate of interest otherwise payable as provided herein, for any period during which any Party Liable Herefor shall be in default under any material provision of any Loan Document. In the event of default followed by collection and enforcement activity by Lender, the Default Interest Rate shall accrue and be payable until actual payment and satisfaction of all Amounts Owing Hereunder.

360-DAY YEAR. All interest hereunder shall be computed on the basis of the actual number of days elapsed over a 360-day year.

All payments due hereunder shall be payable to PEOPLES HERITAGE BANK at any of its offices, or to such other parties or addresses as Lender may from time to time designate in writing. After the date of this Note, if future advances are made to the Maker under this Note, such advances shall be added to the principal balance due hereunder, shall bear interest as provided in this Note, and shall be governed by all of the terms of this Note.

This Note and any extensions, renewals, refinances hereof and substitutions herefor shall be deemed to be secured by the terms of any mortgages or other security documents now held by, or in the future to be granted to, Lender, whether from the Maker or any other Party Liable Herefor, and whether or not such security is described below. Lender shall have the right, without notice, to reduce to possession and to set-off against any and all obligations and liabilities of the Maker any account, deposit or other property of the Maker coming into Lender's possession, or any other claim of the Maker against Lender.

This Note and all Amounts Owing Hereunder shall become immediately due and payable, without notice or demand, if a default be made in the obligation to make any required payment of principal and/or interest which continues for fifteen (15) days beyond its due date. This Note and all Amounts Owing Hereunder shall also become due and payable, subject to a fifteen (15) day written notice and cure period, if default be made in the performance of any

CONFIDENTIAL

other obligation referred to in this Note or in any Loan Document or upon the occurrence of any of the following to or by any Party Liable Herefor: death; dissolution; complete or partial liquidation; transfer of a sufficient amount of voting stock such that control is transferred (if any such party is a corporation); transfer of a controlling interest (if any such party is a partnership or limited liability company); suspension of business; termination of existence; insolvency; the appointment of or taking possession by a receiver, trustee, assignee, bailee, creditor, or other custodian of substantially all property; commencement of any kind of insolvency, dissolution or bankruptcy proceeding; attachment, trustee process, lien, levy or similar action (collectively a "Lien") against any sums credited by or due from Lender to any such parties; the transfer of substantial assets to third parties out of the ordinary course of business; default in the Maker's obligations to Lender or to any other institutional lender on any debt instrument or documentation governing or securing such debt instrument; or if Lender in good faith deems itself insecure because the prospect of repayment, or the value of any collateral, or the priority of any of the Loan Documents is impaired. Notwithstanding the foregoing there shall be a sixty (60) day grace period for any Party Liable Herefor to obtain dismissal of an involuntary bankruptcy or insolvency proceeding, and a thirty (30) day grace period for any Party Liable Herefor to obtain dismissal of any Lien, by bond or otherwise, provided that Lender shall have the right during such grace periods to take all actions and enforce all rights and remedies which Lender deems necessary or convenient to protect its interests. Any notice required hereunder shall be effective on mailing, by first class mail postage prepaid, to Maker at Maker's last known address.

All Parties Liable Herefor acknowledge and agree that Lender may sell or transfer any or all of the Loan Documents, with or without consideration, to a purchaser, whether in a recognized commercial loan secondary market or otherwise, and thereupon all obligations of Lender to the Parties Liable Herefor, if any, shall cease.

Delay or failure on the part of Lender in exercising any rights hereunder shall not operate as a waiver of these or any other rights under this Note. After the due date, or acceleration or demand of all Amounts Owing Hereunder, the acceptance by Lender of any payment representing less than the total balance of all Amounts Owing Hereunder shall not constitute a waiver or relinquishment of Lender's right to full and immediate payment of all remaining Amounts Owing Hereunder.

All Parties Liable Herefor agree to pay, upon demand, all expenses of any nature, whenever incurred, whether incurred in or out of court, including but not limited to reasonable attorney's fees and costs, which Lender may deem necessary or proper in connection with the collection or satisfaction of the indebtedness, or the administration, supervision, preservation, protection or realization of the Loan Documents or any collateral. Lender is authorized, but not required, to pay at any time and from time to time any or all of such expenses, add the amount of such payment to the amount of the principal indebtedness hereunder and charge interest thereon at the rate specified herein.

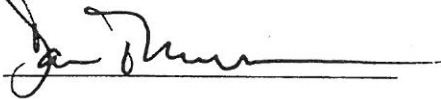
All Parties Liable Herefor hereby waive demand, presentment, notice of dishonor and protest. This Note shall take effect as if under seal. This Note evidences a loan for business and/or commercial purposes.

All Parties Liable Herefor assent to its terms and consent to any and all modifications, extensions or indulgences, to any substitution, exchange or release of collateral and/or to the addition or release of any other party or person primarily or secondarily liable, all without notice, and generally defer all suretyship rights and defenses while any sums remain outstanding hereunder. Each Party Liable Herefor waives all rights of exoneration against any other Party Liable Herefor, and defers all rights of reimbursement, contribution, and subrogation against any other Party Liable Herefor, while any sums remain outstanding hereunder.

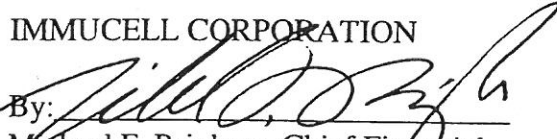
All Parties Liable Herefor submit to the jurisdiction of the courts of the State of Maine and of the United States of America located within the State of Maine, in connection with any suit or proceeding arising hereunder or under any Loan Document.

This Note is secured by a Mortgage on premises at 56 Evergreen Drive, Portland (Lot #3, Evergreen Industrial Park), and by an assignment of leases and a security interest in fixtures and equipment related to the premises.

WITNESS:



IMMUCELL CORPORATION

By: 
Michael F. Brigham, Chief Financial
Officer and Treasurer

ImmgenD.Doc
05/05/98 9:29 AM

CONFIDENTIAL

FINANCIAL CAPACITY

ImmuCell

May 21, 2014

Portland City Hall
Department of Planning and Development
389 Congress Street
Portland, ME 04101

To Whom It May Concern:

ImmuCell Corporation is a publically-held company (NasdaqCM: ICCG) with approximately \$5,472,000 in cash and long-term investments at March 31, 2014. Our financials are audited annually by Baker, Newman & Noyes, LLC and we filed quarterly with the SEC.

The project underlying this permit application has been authorized by our Board of Directors. We pay for investments of this nature with available cash.

Please contact me if you have any questions or comments.

Best regards,



Michael F. Brigham
President and CEO

ImmuCell Corporation

56 Evergreen Drive • Portland, Maine 04103
Telephone (207) 878-2770 • Telefax (207) 878-2117
www.ImmuCell.com

**WATER AND SEWER
DEPARTMENT LETTERS**



May 16, 2014

Mr. Rico Spugnardi
Portland Water District
225 Douglass St.
Portland, ME 04104-3553

Re: Immucell Corporation
Building Addition
56 Evergreen Drive
Portland, ME
Harriman Project 14326
Request for Capacity Letter

Dear Rico:

We are assisting the Immucell Corporation in designing a building addition to their manufacturing building on Evergreen Drive in Portland. It is a small 7,290 sq.ft. two-story addition to their storage and shipping area. There will be no new water-using fixtures or equipment in the new addition, and no new waterline connections. However, the expansion will employ as many as five additional employees. Using the Maine Subsurface Waste Water Disposal Rules, employees at the place of employment with no showers are estimated at 12 gallons per day per employee. Therefore, the estimated additional daily flow for the Immucell site would be $5 \times 12\text{gpd/person} = 60$ gallons/day.

Please send us a letter stating the adequacy of the existing water supply system to serve the building addition. This letter is required by the City of Portland for the Site Development Review application. Thank you for your time and please call if you have questions or concerns.

46 HARRIMAN DRIVE
AUBURN, ME 04210
207.784.5100

Sincerely,
Harriman

A handwritten signature in black ink, appearing to read 'Frank L. Crabtree', with a long horizontal flourish extending to the right.

Frank L. Crabtree, P.E., LEED AP BD+C
Associate
fcrabtree@harriman.com

123 MIDDLE STREET
PORTLAND, ME 04101
207.775.0053

ONE PERIMETER ROAD
MANCHESTER, NH 03103
603.626.1242

Typist's initials

www.harriman.com



May 16, 2014

Mr. Frank Brancely
Department of Public Services
55 Portland Street
Portland, ME 04101-2991

Re: Immucell Corporation
Building Addition
56 Evergreen Drive
Portland, ME
Harriman Project 14326
Request for Capacity Letter

Dear Mr. Brancely:

We are assisting the Immucell Corporation in designing a building addition to their manufacturing building on Evergreen Drive in Portland. It is a small 7,290 sq.ft. two-story addition to their storage and shipping area. There will be no new water-using fixtures or equipment in the new addition, and there will be no new sewer connections in the public way. However, the expansion will employ as many as five additional employees. Using the Maine Subsurface Waste Water Disposal Rules, employees at the place of employment with no showers are estimated at 12 gallons per day per employee. Therefore, the estimated additional daily flow for the Immucell site would be $5 \times 12\text{gpd/person} = 60\text{ gallons/day}$.

Please send us a letter stating the adequacy of the existing municipal wastewater system to serve the additional staff, due to the building addition. This letter is required by the City of Portland for the Site Development Review application. Thank you for your time and please call if you have questions or concerns.

46 HARRIMAN DRIVE
AUBURN, ME 04210
207.784.5100

123 MIDDLE STREET
PORTLAND, ME 04101
207.775.0053

ONE PERIMETER ROAD
MANCHESTER, NH 03103
603.626.1242

Sincerely,
Harriman

A handwritten signature in black ink, appearing to read 'Frank L. Crabtree', written over a horizontal line.

Frank L. Crabtree, P.E., LEED AP BD+C
Associate
fcrabtree@harriman.com

Typist's initials

www.harriman.com

STORM WATER MANAGEMENT

STORMWATER MANAGEMENT NARRATIVE

Immucell Corporation
Building and Site Addition
Portland, Maine - May 16, 2014

Designer

The stormwater management system, including conveyance pipes and structures, drainage swales, treatment basins and erosion control measures, has been designed under the supervision of Frank L. Crabtree, PE (ME Professional Engineering License #3993).

Description

Immucell Corporation is proposing to expand their manufacturing capacity by adding a two-story building, including storage and loading dock spaces, at their facility at 56 Evergreen Drive. The proposed building will be approximately 3645 square feet (0.08 acre) of ground floor area, and 7290 sq. ft. total for both floors. The entire building addition will displace existing impervious pavement and gravel in the truck yard, and will add no new impervious area to the site.

To reconfigure the truck maneuvering yard, the existing pavement will be expanded and the existing small parking area will be slightly relocated and will grow by 7 new parking spaces. This will add approximately 3360 sq.ft. of new impervious area in an existing vegetated strip. However, the renovation of the truck yard will also remove approximately 2490 sq.ft. of existing impervious gravel and replace it with grass. Since all of the new building and most of the new pavements are replacing existing impervious surfaces, the total increased impervious surface following construction will be only approximately 870 sq.ft. (0.02 acres).

Stormwater Quality Control

As noted above, the new impervious paved parking expansion will displace an existing vegetated area. Even though the net increase in impervious area is only 870 sq.ft., the City of Portland ordinance requires a storm water treatment design, consistent with DEP Chapter 500 rules. Runoff from the new pavement area is proposed to be captured and treated by a narrow vegetated filter basin along the edge of the new parking, designated as Pond 1 (Filter Basin).

Pond 1 will capture runoff from 1580 sq. ft. of pavement, and 1820 sq. ft. of existing lawn area. The required water quality volume to treat the area is 192 cf. The underdrained vegetated filter basin is designed to hold 12" of open water, with an 18" sand filter and underdrain pipes beneath. The filter basin is sized at 360 cf, exceeding the minimum water quality volume.

The attached Stormwater Quality Summary Worksheet tabulates the various surfaces in the five subcatchment areas (1 thru 5). Treatment occurs only in Subcatchment 5. The notes below the table explain that the treatment ratio of the new impervious area treated is 115%

of the net new impervious area, which meets the 95% requirement of the Chapter 500 standards. For the New Developed areas, not considering the re-vegetation of the existing gravel impervious area, the treatment ratio is only 30%. To remedy this, we propose to also capture and treat existing impervious pavement and vegetated areas, which do not otherwise require treatment. Combining the treatment of both new and existing impervious areas yields a treatment ratio of 101% of the new developed areas, which exceeds the 80% requirements in the General Standards.

Stormwater Quantity Control

According to the City of Portland ordinance, the Flooding Standard is also applicable. The pre-development and post-development runoff calculations were modeled by the Hydrocad computer program (version 9.0), which uses the Soil Conservation Service TR-55 and TR-20 methods. The 24-hour rainfall for Cumberland County is 5.5" for 25-year, 4.7" for 10-year, and 3.0" for 2-year. Runoff for the 24-hour Type III storm was modeled for 25-year, 10-year, and 2-year frequencies, and compared in the following summary:

Watershed Analysis Point	Pre-Development	Post-Development	Peak Flow Change
'A' – East Corner of the Property. "Reach 1"	25 Year = 5.78 cfs 10 Year = 4.81 2 Year = 2.74	25 Year = 5.40 cfs 10 Year = 4.52 2 Year = 2.63	-0.38 cfs -0.29 -0.11
'B' – Northeast Property Line. "Reach 2"	25 Year = 1.96 cfs 10 Year = 1.61 2 Year = 0.87	25 Year = 1.96 cfs 10 Year = 1.61 2 Year = 0.87	0 cfs 0 0

In summary, the stormwater flow rate leaving the property along the northeast and east sides following construction will be very slightly reduced. Construction of the new building addition and pavements will therefore have no measurable impact to abutters or downstream drainage ways.

The Filter Basin(Pond 1) will primarily treat the runoff from the new parking area for water quality. However, it will also detain the runoff for quantity control as the water filters slowly through the bed.

STORMWATER QUALITY SUMMARY - DEP CHAPTER 500

Project: Immuell Corporation Additions
Portland, Maine

Date: 5/14/2014

Project No. 14326

Watershed Subcatchments - Quality Treatment:

Subcatch Number	New Pavement on Exist. Vegetated Sq. Ft.	New Vegetated on Exist. Impervious Sq. Ft.	New Impervious Area Treated Sq. Ft.	Exist. Impervious Area Treated Sq. Ft.	Exist Vegetated Area Treated Sq. Ft.	Treated by:
1	2360	2490	0	0	0	
2	0	0	0	0	0	
3	0	0	0	0	0	
4	0	0	0	0	0	
5	1000	0	1000	580	1820	Filter Bed - Pond 1
Totals =	3360	2490	1000	580	1820	

NOTES

1. The amount of New Impervious area receiving treatment is 1000 sq.ft.
Total net new impervious area on the site is 870 sq.ft.(3360 - 2490).
The Impervious Treatment Ratio is 115% (1000/870) which meets the 95% General Standard.
2. Total New Developed area treated is 1000 sq.ft.
Total New Developed area on the site is 3360 sq.ft., since there is no non-impervious developed area.
The Developed Treatment Ratio is 30% (1000/3360) which does not meet the 80% General Standard.
Adding the Existing Impervious and Vegetated Areas being treated, the resulting Combined Developed Treatment Ratio is 101% ((1000+580+1820)/3360) which exceeds the 80% General Standard.

STORMWATER QUALITY - TREATMENT SIZING

Project: Immucell Building Addition
Portland, Maine
Project No. 14326

Date 5/15/2014

Underdrained Soil Filter - Pond 1 Subcatch 5S

IMPERVIOUS AREAS CAPTURED: (proposed) = 1,580 sf

GRASS AREAS CAPTURED:(proposed) = 1,820 sf

MIN. FILTER BED SIZE:

(1"/12") 1580 + (0.4"/12") 1820 = 192 cf min. bed Water Quality Vol.(WQV)

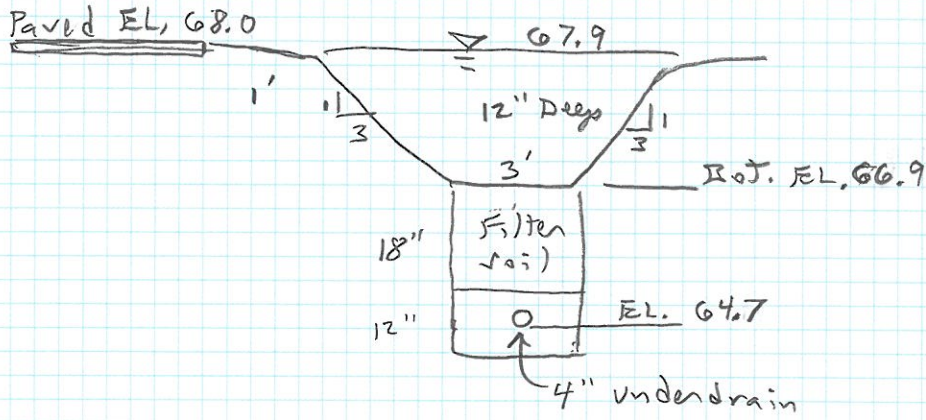
5% 1,580 + 2% 1,820 = 115 sf minimum bed area

Actual Bed Volume Proposed @ Water Quality Volume Depth = 360 cf

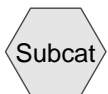
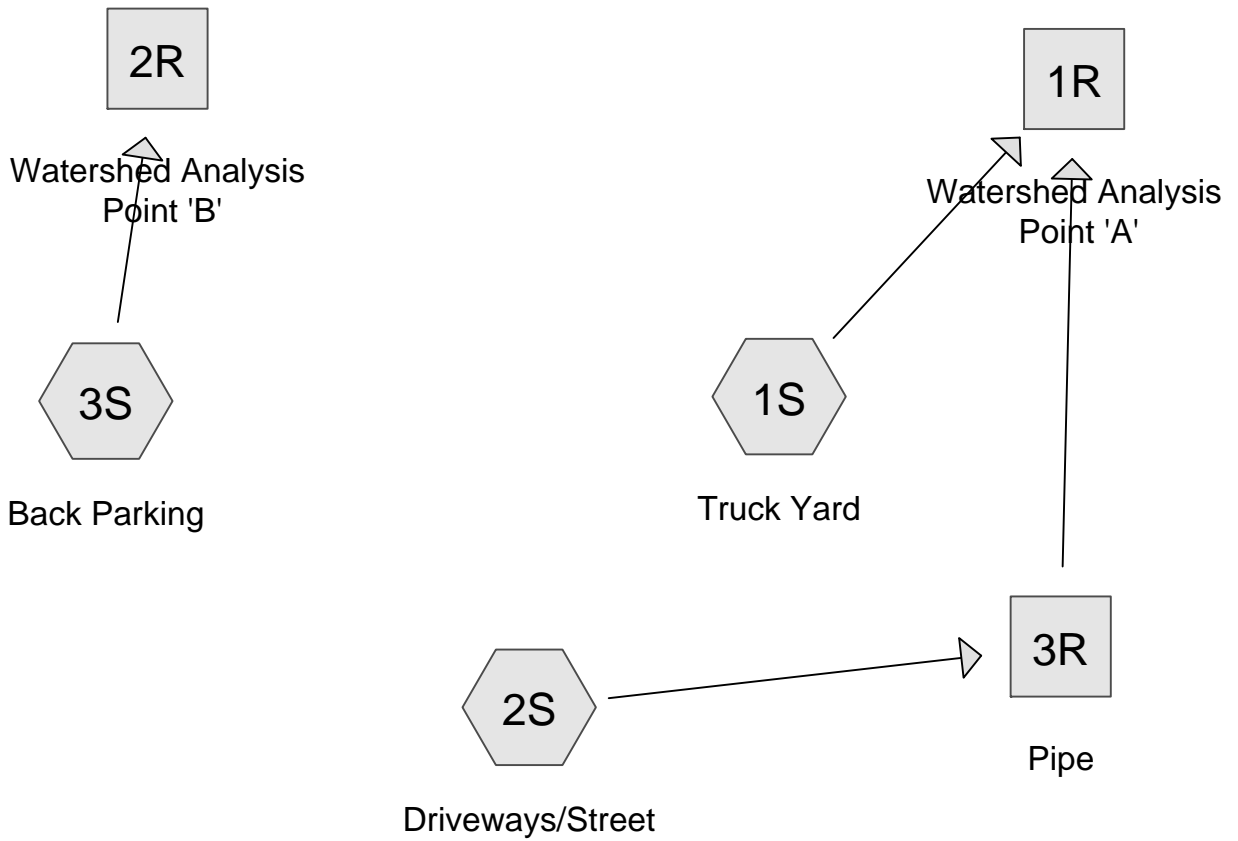
Actual Bed Area Proposed = 180 sf

OK

Vegetated Filter Basin - P1



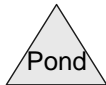
Bed Length = 60' Volume = 60' x (3' + 3') 1' = 360 CF
Bed Area = 60' x 3' = 180 SF



Subcat



Reach



Pond



Link

Immucell Pre-Development 2014

Prepared by HARRIMAN

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Type III 24-hr 2 Year Rainfall=3.00"

Printed 5/22/2014

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Truck YardRunoff Area=24,940 sf 53.89% Impervious Runoff Depth>1.78"
Flow Length=150' Tc=3.3 min CN=89 Runoff=1.37 cfs 0.085 af**Subcatchment 2S: Driveways/Street**Runoff Area=24,450 sf 79.88% Impervious Runoff Depth>2.13"
Flow Length=265' Tc=2.6 min CN=93 Runoff=1.57 cfs 0.100 af**Subcatchment 3S: Back Parking**Runoff Area=17,010 sf 55.32% Impervious Runoff Depth>1.63"
Flow Length=185' Tc=3.0 min CN=87 Runoff=0.87 cfs 0.053 af**Reach 1R: Watershed Analysis Point 'A'**Inflow=2.74 cfs 0.184 af
Outflow=2.74 cfs 0.184 af**Reach 2R: Watershed Analysis Point 'B'**Inflow=0.87 cfs 0.053 af
Outflow=0.87 cfs 0.053 af**Reach 3R: Pipe**Avg. Flow Depth=0.40' Max Vel=4.00 fps Inflow=1.57 cfs 0.100 af
18.0" Round Pipe n=0.010 L=335.0' S=0.0051 '/ Capacity=9.76 cfs Outflow=1.43 cfs 0.099 af

Immucell Pre-Development 2014

Prepared by HARRIMAN

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Type III 24-hr 2 Year Rainfall=3.00"

Printed 5/22/2014

Summary for Subcatchment 1S: Truck Yard

Runoff = 1.37 cfs @ 12.05 hrs, Volume= 0.085 af, Depth> 1.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.00"

	Area (sf)	CN	Description
*	13,440	98	Paved & Roof
*	3,800	89	Gravel
	1,800	74	Pasture/grassland/range, Good, HSG C
	5,900	74	>75% Grass cover, Good, HSG C
	24,940	89	Weighted Average
	11,500		46.11% Pervious Area
	13,440		53.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	40	0.0030	0.52		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
1.7	85	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	25	0.0070	1.35		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
3.3	150	Total			

Summary for Subcatchment 2S: Driveways/Street

Runoff = 1.57 cfs @ 12.04 hrs, Volume= 0.100 af, Depth> 2.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.00"

	Area (sf)	CN	Description
*	19,530	98	Paved & Roof
	4,920	74	>75% Grass cover, Good, HSG C
	24,450	93	Weighted Average
	4,920		20.12% Pervious Area
	19,530		79.88% Impervious Area

Immucell Pre-Development 2014

Prepared by HARRIMAN

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Type III 24-hr 2 Year Rainfall=3.00"

Printed 5/22/2014

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0130	1.01		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
0.5	65	0.0120	2.22		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	30	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.2	50	0.0040	4.33	5.31	Pipe Channel, Culvert 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.6	60	0.0130	1.71		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
2.6	265	Total			

Summary for Subcatchment 3S: Back Parking

Runoff = 0.87 cfs @ 12.05 hrs, Volume= 0.053 af, Depth> 1.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.00"

Area (sf)	CN	Description
* 9,410	98	Paved & Roof
4,000	72	Woods/grass comb., Good, HSG C
3,600	74	>75% Grass cover, Good, HSG C
17,010	87	Weighted Average
7,600		44.68% Pervious Area
9,410		55.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	40	0.0250	1.21		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
1.3	80	0.0025	1.02		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	65	0.0340	0.92		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.0	185	Total			

Summary for Reach 1R: Watershed Analysis Point 'A'

Inflow Area = 1.134 ac, 66.75% Impervious, Inflow Depth > 1.95" for 2 Year event

Inflow = 2.74 cfs @ 12.07 hrs, Volume= 0.184 af

Outflow = 2.74 cfs @ 12.07 hrs, Volume= 0.184 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach 2R: Watershed Analysis Point 'B'

Inflow Area = 0.390 ac, 55.32% Impervious, Inflow Depth > 1.63" for 2 Year event
Inflow = 0.87 cfs @ 12.05 hrs, Volume= 0.053 af
Outflow = 0.87 cfs @ 12.05 hrs, Volume= 0.053 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach 3R: Pipe

Inflow Area = 0.561 ac, 79.88% Impervious, Inflow Depth > 2.13" for 2 Year event
Inflow = 1.57 cfs @ 12.04 hrs, Volume= 0.100 af
Outflow = 1.43 cfs @ 12.09 hrs, Volume= 0.099 af, Atten= 9%, Lag= 2.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 4.00 fps, Min. Travel Time= 1.4 min

Avg. Velocity= 1.40 fps, Avg. Travel Time= 4.0 min

Peak Storage= 127 cf @ 12.06 hrs

Average Depth at Peak Storage= 0.40'

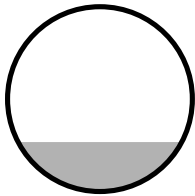
Bank-Full Depth= 1.50', Capacity at Bank-Full= 9.76 cfs

18.0" Round Pipe

n= 0.010

Length= 335.0' Slope= 0.0051 '/'

Inlet Invert= 64.26', Outlet Invert= 62.55'



Immucell Pre-Development 2014

Prepared by HARRIMAN

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Type III 24-hr 10 Year Rainfall=4.70"

Printed 5/22/2014

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Truck YardRunoff Area=24,940 sf 53.89% Impervious Runoff Depth>3.29"
Flow Length=150' Tc=3.3 min CN=89 Runoff=2.45 cfs 0.157 af**Subcatchment 2S: Driveways/Street**Runoff Area=24,450 sf 79.88% Impervious Runoff Depth>3.69"
Flow Length=265' Tc=2.6 min CN=93 Runoff=2.64 cfs 0.173 af**Subcatchment 3S: Back Parking**Runoff Area=17,010 sf 55.32% Impervious Runoff Depth>3.10"
Flow Length=185' Tc=3.0 min CN=87 Runoff=1.61 cfs 0.101 af**Reach 1R: Watershed Analysis Point 'A'**Inflow=4.81 cfs 0.329 af
Outflow=4.81 cfs 0.329 af**Reach 2R: Watershed Analysis Point 'B'**Inflow=1.61 cfs 0.101 af
Outflow=1.61 cfs 0.101 af**Reach 3R: Pipe**Avg. Flow Depth=0.53' Max Vel=4.65 fps Inflow=2.64 cfs 0.173 af
18.0" Round Pipe n=0.010 L=335.0' S=0.0051 '/' Capacity=9.76 cfs Outflow=2.41 cfs 0.172 af

Summary for Subcatchment 1S: Truck Yard

Runoff = 2.45 cfs @ 12.05 hrs, Volume= 0.157 af, Depth> 3.29"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.70"

	Area (sf)	CN	Description
*	13,440	98	Paved & Roof
*	3,800	89	Gravel
	1,800	74	Pasture/grassland/range, Good, HSG C
	5,900	74	>75% Grass cover, Good, HSG C
	24,940	89	Weighted Average
	11,500		46.11% Pervious Area
	13,440		53.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	40	0.0030	0.52		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
1.7	85	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	25	0.0070	1.35		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
3.3	150	Total			

Summary for Subcatchment 2S: Driveways/Street

Runoff = 2.64 cfs @ 12.04 hrs, Volume= 0.173 af, Depth> 3.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.70"

	Area (sf)	CN	Description
*	19,530	98	Paved & Roof
	4,920	74	>75% Grass cover, Good, HSG C
	24,450	93	Weighted Average
	4,920		20.12% Pervious Area
	19,530		79.88% Impervious Area

Immucell Pre-Development 2014

Type III 24-hr 10 Year Rainfall=4.70"

Prepared by HARRIMAN

Printed 5/22/2014

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0130	1.01		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
0.5	65	0.0120	2.22		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	30	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.2	50	0.0040	4.33	5.31	Pipe Channel, Culvert 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.6	60	0.0130	1.71		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
2.6	265	Total			

Summary for Subcatchment 3S: Back Parking

Runoff = 1.61 cfs @ 12.05 hrs, Volume= 0.101 af, Depth> 3.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.70"

Area (sf)	CN	Description
* 9,410	98	Paved & Roof
4,000	72	Woods/grass comb., Good, HSG C
3,600	74	>75% Grass cover, Good, HSG C
17,010	87	Weighted Average
7,600		44.68% Pervious Area
9,410		55.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	40	0.0250	1.21		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
1.3	80	0.0025	1.02		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	65	0.0340	0.92		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.0	185	Total			

Summary for Reach 1R: Watershed Analysis Point 'A'

Inflow Area = 1.134 ac, 66.75% Impervious, Inflow Depth > 3.49" for 10 Year event
Inflow = 4.81 cfs @ 12.06 hrs, Volume= 0.329 af
Outflow = 4.81 cfs @ 12.06 hrs, Volume= 0.329 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach 2R: Watershed Analysis Point 'B'

Inflow Area = 0.390 ac, 55.32% Impervious, Inflow Depth > 3.10" for 10 Year event
Inflow = 1.61 cfs @ 12.05 hrs, Volume= 0.101 af
Outflow = 1.61 cfs @ 12.05 hrs, Volume= 0.101 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach 3R: Pipe

Inflow Area = 0.561 ac, 79.88% Impervious, Inflow Depth > 3.69" for 10 Year event
Inflow = 2.64 cfs @ 12.04 hrs, Volume= 0.173 af
Outflow = 2.41 cfs @ 12.08 hrs, Volume= 0.172 af, Atten= 9%, Lag= 2.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 4.65 fps, Min. Travel Time= 1.2 min

Avg. Velocity= 1.69 fps, Avg. Travel Time= 3.3 min

Peak Storage= 185 cf @ 12.06 hrs

Average Depth at Peak Storage= 0.53'

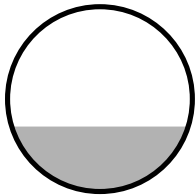
Bank-Full Depth= 1.50', Capacity at Bank-Full= 9.76 cfs

18.0" Round Pipe

n= 0.010

Length= 335.0' Slope= 0.0051 '/'

Inlet Invert= 64.26', Outlet Invert= 62.55'



Immucell Pre-Development 2014

Prepared by HARRIMAN

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Type III 24-hr 25 Year Rainfall=5.50"

Printed 5/22/2014

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Truck YardRunoff Area=24,940 sf 53.89% Impervious Runoff Depth>4.02"
Flow Length=150' Tc=3.3 min CN=89 Runoff=2.96 cfs 0.192 af**Subcatchment 2S: Driveways/Street**Runoff Area=24,450 sf 79.88% Impervious Runoff Depth>4.43"
Flow Length=265' Tc=2.6 min CN=93 Runoff=3.13 cfs 0.207 af**Subcatchment 3S: Back Parking**Runoff Area=17,010 sf 55.32% Impervious Runoff Depth>3.81"
Flow Length=185' Tc=3.0 min CN=87 Runoff=1.96 cfs 0.124 af**Reach 1R: Watershed Analysis Point 'A'**Inflow=5.78 cfs 0.399 af
Outflow=5.78 cfs 0.399 af**Reach 2R: Watershed Analysis Point 'B'**Inflow=1.96 cfs 0.124 af
Outflow=1.96 cfs 0.124 af**Reach 3R: Pipe**Avg. Flow Depth=0.58' Max Vel=4.88 fps Inflow=3.13 cfs 0.207 af
18.0" Round Pipe n=0.010 L=335.0' S=0.0051 '/ Capacity=9.76 cfs Outflow=2.87 cfs 0.207 af

Immucell Pre-Development 2014

Prepared by HARRIMAN

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Type III 24-hr 25 Year Rainfall=5.50"

Printed 5/22/2014

Summary for Subcatchment 1S: Truck Yard

Runoff = 2.96 cfs @ 12.05 hrs, Volume= 0.192 af, Depth> 4.02"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.50"

	Area (sf)	CN	Description
*	13,440	98	Paved & Roof
*	3,800	89	Gravel
	1,800	74	Pasture/grassland/range, Good, HSG C
	5,900	74	>75% Grass cover, Good, HSG C
	24,940	89	Weighted Average
	11,500		46.11% Pervious Area
	13,440		53.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	40	0.0030	0.52		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
1.7	85	0.0150	0.86		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.3	25	0.0070	1.35		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
3.3	150	Total			

Summary for Subcatchment 2S: Driveways/Street

Runoff = 3.13 cfs @ 12.04 hrs, Volume= 0.207 af, Depth> 4.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.50"

	Area (sf)	CN	Description
*	19,530	98	Paved & Roof
	4,920	74	>75% Grass cover, Good, HSG C
	24,450	93	Weighted Average
	4,920		20.12% Pervious Area
	19,530		79.88% Impervious Area

Immucell Pre-Development 2014

Prepared by HARRIMAN

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Type III 24-hr 25 Year Rainfall=5.50"

Printed 5/22/2014

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0130	1.01		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
0.5	65	0.0120	2.22		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	30	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.2	50	0.0040	4.33	5.31	Pipe Channel, Culvert 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.6	60	0.0130	1.71		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps
2.6	265	Total			

Summary for Subcatchment 3S: Back Parking

Runoff = 1.96 cfs @ 12.05 hrs, Volume= 0.124 af, Depth> 3.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.50"

Area (sf)	CN	Description
* 9,410	98	Paved & Roof
4,000	72	Woods/grass comb., Good, HSG C
3,600	74	>75% Grass cover, Good, HSG C
17,010	87	Weighted Average
7,600		44.68% Pervious Area
9,410		55.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	40	0.0250	1.21		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
1.3	80	0.0025	1.02		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	65	0.0340	0.92		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.0	185	Total			

Summary for Reach 1R: Watershed Analysis Point 'A'

Inflow Area = 1.134 ac, 66.75% Impervious, Inflow Depth > 4.22" for 25 Year event
Inflow = 5.78 cfs @ 12.06 hrs, Volume= 0.399 af
Outflow = 5.78 cfs @ 12.06 hrs, Volume= 0.399 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach 2R: Watershed Analysis Point 'B'

Inflow Area = 0.390 ac, 55.32% Impervious, Inflow Depth > 3.81" for 25 Year event
Inflow = 1.96 cfs @ 12.05 hrs, Volume= 0.124 af
Outflow = 1.96 cfs @ 12.05 hrs, Volume= 0.124 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach 3R: Pipe

Inflow Area = 0.561 ac, 79.88% Impervious, Inflow Depth > 4.43" for 25 Year event
Inflow = 3.13 cfs @ 12.04 hrs, Volume= 0.207 af
Outflow = 2.87 cfs @ 12.07 hrs, Volume= 0.207 af, Atten= 8%, Lag= 1.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 4.88 fps, Min. Travel Time= 1.1 min

Avg. Velocity= 1.79 fps, Avg. Travel Time= 3.1 min

Peak Storage= 210 cf @ 12.06 hrs

Average Depth at Peak Storage= 0.58'

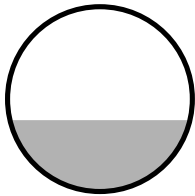
Bank-Full Depth= 1.50', Capacity at Bank-Full= 9.76 cfs

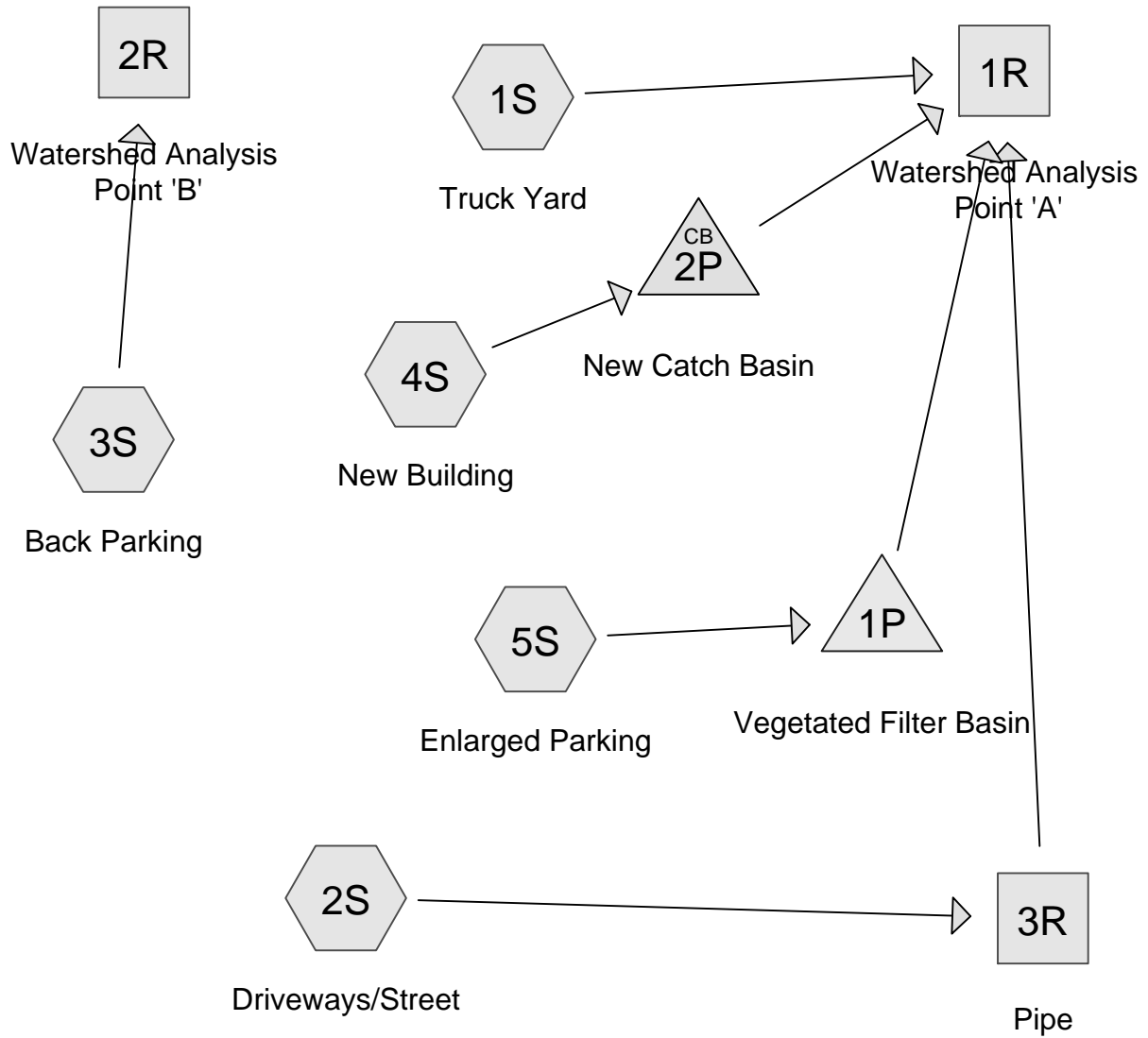
18.0" Round Pipe

n= 0.010

Length= 335.0' Slope= 0.0051 '/'

Inlet Invert= 64.26', Outlet Invert= 62.55'

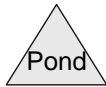




Subcat



Reach



Pond



Link

Drainage Diagram for Immucell POST-Development 2014
 Prepared by HARRIMAN, Printed 5/22/2014
 HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Immucell POST-Development 2014

Prepared by HARRIMAN

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Type III 24-hr 2 Year Rainfall=3.00"

Printed 5/22/2014

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Truck Yard	Runoff Area=14,240 sf 65.31% Impervious Runoff Depth>1.87" Flow Length=165' Tc=2.2 min CN=90 Runoff=0.82 cfs 0.051 af
Subcatchment 2S: Driveways/Street	Runoff Area=24,450 sf 79.88% Impervious Runoff Depth>2.13" Flow Length=265' Tc=2.6 min CN=93 Runoff=1.57 cfs 0.100 af
Subcatchment 3S: Back Parking	Runoff Area=17,010 sf 55.32% Impervious Runoff Depth>1.63" Flow Length=185' Tc=3.0 min CN=87 Runoff=0.87 cfs 0.053 af
Subcatchment 4S: New Building	Runoff Area=7,300 sf 100.00% Impervious Runoff Depth>2.59" Flow Length=150' Tc=1.2 min CN=98 Runoff=0.54 cfs 0.036 af
Subcatchment 5S: Enlarged Parking	Runoff Area=3,400 sf 46.47% Impervious Runoff Depth>1.48" Flow Length=60' Slope=0.0130 '/' Tc=1.0 min CN=85 Runoff=0.16 cfs 0.010 af
Reach 1R: Watershed Analysis Point 'A'	Inflow=2.63 cfs 0.186 af Outflow=2.63 cfs 0.186 af
Reach 2R: Watershed Analysis Point 'B'	Inflow=0.87 cfs 0.053 af Outflow=0.87 cfs 0.053 af
Reach 3R: Pipe	Avg. Flow Depth=0.40' Max Vel=4.00 fps Inflow=1.57 cfs 0.100 af 18.0" Round Pipe n=0.010 L=335.0' S=0.0051 '/' Capacity=9.76 cfs Outflow=1.43 cfs 0.099 af
Pond 1P: Vegetated Filter Basin	Peak Elev=67.43' Storage=155 cf Inflow=0.16 cfs 0.010 af Discarded=0.02 cfs 0.010 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.010 af
Pond 2P: New Catch Basin	Peak Elev=64.38' Inflow=0.54 cfs 0.036 af 10.0" Round Culvert n=0.010 L=45.0' S=0.0000 '/' Outflow=0.54 cfs 0.036 af

Immucell POST-Development 2014

Prepared by HARRIMAN

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Type III 24-hr 2 Year Rainfall=3.00"

Printed 5/22/2014

Summary for Subcatchment 1S: Truck Yard

Runoff = 0.82 cfs @ 12.04 hrs, Volume= 0.051 af, Depth> 1.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.00"

Area (sf)	CN	Description
* 9,300	98	Paved & Roof
4,940	74	>75% Grass cover, Good, HSG C
14,240	90	Weighted Average
4,940		34.69% Pervious Area
9,300		65.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	90	0.0220	1.35		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
0.3	40	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.8	35	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
2.2	165	Total			

Summary for Subcatchment 2S: Driveways/Street

Runoff = 1.57 cfs @ 12.04 hrs, Volume= 0.100 af, Depth> 2.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.00"

Area (sf)	CN	Description
* 19,530	98	Paved & Roof
4,920	74	>75% Grass cover, Good, HSG C
24,450	93	Weighted Average
4,920		20.12% Pervious Area
19,530		79.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0130	1.01		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
0.5	65	0.0120	2.22		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	30	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.2	50	0.0040	4.33	5.31	Pipe Channel, Culvert 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.6	60	0.0130	1.71		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps

Immucell POST-Development 2014

Prepared by HARRIMAN

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Type III 24-hr 2 Year Rainfall=3.00"

Printed 5/22/2014

2.6 265 Total

Summary for Subcatchment 3S: Back Parking

Runoff = 0.87 cfs @ 12.05 hrs, Volume= 0.053 af, Depth> 1.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.00"

Area (sf)	CN	Description
* 9,410	98	Paved & Roof
4,000	72	Woods/grass comb., Good, HSG C
3,600	74	>75% Grass cover, Good, HSG C
17,010	87	Weighted Average
7,600		44.68% Pervious Area
9,410		55.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	40	0.0250	1.21		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
1.3	80	0.0025	1.02		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	65	0.0340	0.92		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.0	185	Total			

Summary for Subcatchment 4S: New Building

Runoff = 0.54 cfs @ 12.02 hrs, Volume= 0.036 af, Depth> 2.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.00"

Area (sf)	CN	Description
* 7,300	98	Roof
7,300		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	45	0.0500	1.64		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
0.6	40	0.0200	1.11		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
0.1	65	0.0200	7.39	4.03	Pipe Channel, 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.010
1.2	150	Total			

Immucell POST-Development 2014

Prepared by HARRIMAN

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Type III 24-hr 2 Year Rainfall=3.00"

Printed 5/22/2014

Summary for Subcatchment 5S: Enlarged Parking

Runoff = 0.16 cfs @ 12.02 hrs, Volume= 0.010 af, Depth> 1.48"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 Year Rainfall=3.00"

	Area (sf)	CN	Description
*	1,580	98	Paved
	1,820	74	>75% Grass cover, Good, HSG C
	3,400	85	Weighted Average
	1,820		53.53% Pervious Area
	1,580		46.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0130	1.01		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"

Summary for Reach 1R: Watershed Analysis Point 'A'Inflow Area = 1.134 ac, 76.35% Impervious, Inflow Depth > 1.97" for 2 Year event
Inflow = 2.63 cfs @ 12.05 hrs, Volume= 0.186 af
Outflow = 2.63 cfs @ 12.05 hrs, Volume= 0.186 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach 2R: Watershed Analysis Point 'B'Inflow Area = 0.390 ac, 55.32% Impervious, Inflow Depth > 1.63" for 2 Year event
Inflow = 0.87 cfs @ 12.05 hrs, Volume= 0.053 af
Outflow = 0.87 cfs @ 12.05 hrs, Volume= 0.053 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach 3R: PipeInflow Area = 0.561 ac, 79.88% Impervious, Inflow Depth > 2.13" for 2 Year event
Inflow = 1.57 cfs @ 12.04 hrs, Volume= 0.100 af
Outflow = 1.43 cfs @ 12.09 hrs, Volume= 0.099 af, Atten= 9%, Lag= 2.5 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 4.00 fps, Min. Travel Time= 1.4 min
Avg. Velocity= 1.40 fps, Avg. Travel Time= 4.0 minPeak Storage= 127 cf @ 12.06 hrs
Average Depth at Peak Storage= 0.40'
Bank-Full Depth= 1.50', Capacity at Bank-Full= 9.76 cfs

Immucell POST-Development 2014

Prepared by HARRIMAN

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Type III 24-hr 2 Year Rainfall=3.00"

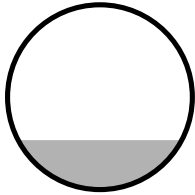
Printed 5/22/2014

18.0" Round Pipe

n= 0.010

Length= 335.0' Slope= 0.0051 1'

Inlet Invert= 64.26', Outlet Invert= 62.55'



Summary for Pond 1P: Vegetated Filter Basin

Inflow Area = 0.078 ac, 46.47% Impervious, Inflow Depth > 1.48" for 2 Year event

Inflow = 0.16 cfs @ 12.02 hrs, Volume= 0.010 af

Outflow = 0.02 cfs @ 12.52 hrs, Volume= 0.010 af, Atten= 86%, Lag= 30.4 min

Discarded = 0.02 cfs @ 12.52 hrs, Volume= 0.010 af

Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Peak Elev= 67.43' @ 12.52 hrs Surf.Area= 399 sf Storage= 155 cf

Plug-Flow detention time= 66.8 min calculated for 0.010 af (100% of inflow)

Center-of-Mass det. time= 66.1 min (855.0 - 788.9)

Volume	Invert	Avail.Storage	Storage Description
#1	66.90'	2,062 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.90	180	0	0
67.90	590	385	385
68.50	5,000	1,677	2,062

Device	Routing	Invert	Outlet Devices
#1	Primary	67.90'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	66.90'	2.400 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.02 cfs @ 12.52 hrs HW=67.43' (Free Discharge)

↳ **2=Exfiltration** (Exfiltration Controls 0.02 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=66.90' (Free Discharge)

↳ **1=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Immucell POST-Development 2014

Prepared by HARRIMAN

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Type III 24-hr 2 Year Rainfall=3.00"

Printed 5/22/2014

Summary for Pond 2P: New Catch Basin

Inflow Area = 0.168 ac, 100.00% Impervious, Inflow Depth > 2.59" for 2 Year event
 Inflow = 0.54 cfs @ 12.02 hrs, Volume= 0.036 af
 Outflow = 0.54 cfs @ 12.02 hrs, Volume= 0.036 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.54 cfs @ 12.02 hrs, Volume= 0.036 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 64.38' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	63.80'	10.0" Round Culvert L= 45.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 63.80' / 63.80' S= 0.0000 '/ Cc= 0.900 n= 0.010

Primary OutFlow Max=0.51 cfs @ 12.02 hrs HW=64.37' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 0.51 cfs @ 1.83 fps)

Immucell POST-Development 2014

Type III 24-hr 10 Year Rainfall=4.70"

Prepared by HARRIMAN

Printed 5/22/2014

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Truck Yard	Runoff Area=14,240 sf 65.31% Impervious Runoff Depth>3.39" Flow Length=165' Tc=2.2 min CN=90 Runoff=1.45 cfs 0.092 af
Subcatchment 2S: Driveways/Street	Runoff Area=24,450 sf 79.88% Impervious Runoff Depth>3.69" Flow Length=265' Tc=2.6 min CN=93 Runoff=2.64 cfs 0.173 af
Subcatchment 3S: Back Parking	Runoff Area=17,010 sf 55.32% Impervious Runoff Depth>3.10" Flow Length=185' Tc=3.0 min CN=87 Runoff=1.61 cfs 0.101 af
Subcatchment 4S: New Building	Runoff Area=7,300 sf 100.00% Impervious Runoff Depth>4.15" Flow Length=150' Tc=1.2 min CN=98 Runoff=0.85 cfs 0.058 af
Subcatchment 5S: Enlarged Parking	Runoff Area=3,400 sf 46.47% Impervious Runoff Depth>2.91" Flow Length=60' Slope=0.0130 '/' Tc=1.0 min CN=85 Runoff=0.31 cfs 0.019 af
Reach 1R: Watershed Analysis Point 'A'	Inflow=4.52 cfs 0.323 af Outflow=4.52 cfs 0.323 af
Reach 2R: Watershed Analysis Point 'B'	Inflow=1.61 cfs 0.101 af Outflow=1.61 cfs 0.101 af
Reach 3R: Pipe	Avg. Flow Depth=0.53' Max Vel=4.65 fps Inflow=2.64 cfs 0.173 af 18.0" Round Pipe n=0.010 L=335.0' S=0.0051 '/' Capacity=9.76 cfs Outflow=2.41 cfs 0.172 af
Pond 1P: Vegetated Filter Basin	Peak Elev=67.85' Storage=354 cf Inflow=0.31 cfs 0.019 af Discarded=0.03 cfs 0.018 af Primary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.018 af
Pond 2P: New Catch Basin	Peak Elev=64.55' Inflow=0.85 cfs 0.058 af 10.0" Round Culvert n=0.010 L=45.0' S=0.0000 '/' Outflow=0.85 cfs 0.058 af

Immucell POST-Development 2014

Type III 24-hr 10 Year Rainfall=4.70"

Prepared by HARRIMAN

Printed 5/22/2014

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Summary for Subcatchment 1S: Truck Yard

Runoff = 1.45 cfs @ 12.04 hrs, Volume= 0.092 af, Depth> 3.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.70"

Area (sf)	CN	Description
* 9,300	98	Paved & Roof
4,940	74	>75% Grass cover, Good, HSG C
14,240	90	Weighted Average
4,940		34.69% Pervious Area
9,300		65.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	90	0.0220	1.35		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
0.3	40	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.8	35	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
2.2	165	Total			

Summary for Subcatchment 2S: Driveways/Street

Runoff = 2.64 cfs @ 12.04 hrs, Volume= 0.173 af, Depth> 3.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.70"

Area (sf)	CN	Description
* 19,530	98	Paved & Roof
4,920	74	>75% Grass cover, Good, HSG C
24,450	93	Weighted Average
4,920		20.12% Pervious Area
19,530		79.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0130	1.01		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
0.5	65	0.0120	2.22		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	30	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.2	50	0.0040	4.33	5.31	Pipe Channel, Culvert 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.6	60	0.0130	1.71		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps

2.6 265 Total

Summary for Subcatchment 3S: Back Parking

Runoff = 1.61 cfs @ 12.05 hrs, Volume= 0.101 af, Depth> 3.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.70"

Area (sf)	CN	Description
* 9,410	98	Paved & Roof
4,000	72	Woods/grass comb., Good, HSG C
3,600	74	>75% Grass cover, Good, HSG C
17,010	87	Weighted Average
7,600		44.68% Pervious Area
9,410		55.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	40	0.0250	1.21		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
1.3	80	0.0025	1.02		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	65	0.0340	0.92		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.0	185	Total			

Summary for Subcatchment 4S: New Building

Runoff = 0.85 cfs @ 12.02 hrs, Volume= 0.058 af, Depth> 4.15"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.70"

Area (sf)	CN	Description
* 7,300	98	Roof
7,300		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	45	0.0500	1.64		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
0.6	40	0.0200	1.11		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
0.1	65	0.0200	7.39	4.03	Pipe Channel, 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.010
1.2	150	Total			

Immucell POST-Development 2014

Type III 24-hr 10 Year Rainfall=4.70"

Prepared by HARRIMAN

Printed 5/22/2014

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Summary for Subcatchment 5S: Enlarged Parking

Runoff = 0.31 cfs @ 12.02 hrs, Volume= 0.019 af, Depth> 2.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 Year Rainfall=4.70"

	Area (sf)	CN	Description
*	1,580	98	Paved
	1,820	74	>75% Grass cover, Good, HSG C
	3,400	85	Weighted Average
	1,820		53.53% Pervious Area
	1,580		46.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0130	1.01		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"

Summary for Reach 1R: Watershed Analysis Point 'A'

Inflow Area = 1.134 ac, 76.35% Impervious, Inflow Depth > 3.41" for 10 Year event
 Inflow = 4.52 cfs @ 12.05 hrs, Volume= 0.323 af
 Outflow = 4.52 cfs @ 12.05 hrs, Volume= 0.323 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach 2R: Watershed Analysis Point 'B'

Inflow Area = 0.390 ac, 55.32% Impervious, Inflow Depth > 3.10" for 10 Year event
 Inflow = 1.61 cfs @ 12.05 hrs, Volume= 0.101 af
 Outflow = 1.61 cfs @ 12.05 hrs, Volume= 0.101 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach 3R: Pipe

Inflow Area = 0.561 ac, 79.88% Impervious, Inflow Depth > 3.69" for 10 Year event
 Inflow = 2.64 cfs @ 12.04 hrs, Volume= 0.173 af
 Outflow = 2.41 cfs @ 12.08 hrs, Volume= 0.172 af, Atten= 9%, Lag= 2.1 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 4.65 fps, Min. Travel Time= 1.2 min
 Avg. Velocity = 1.69 fps, Avg. Travel Time= 3.3 min

Peak Storage= 185 cf @ 12.06 hrs
 Average Depth at Peak Storage= 0.53'
 Bank-Full Depth= 1.50', Capacity at Bank-Full= 9.76 cfs

Immucell POST-Development 2014

Prepared by HARRIMAN

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Type III 24-hr 10 Year Rainfall=4.70"

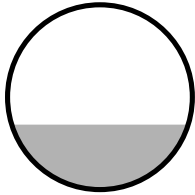
Printed 5/22/2014

18.0" Round Pipe

n= 0.010

Length= 335.0' Slope= 0.0051 1'

Inlet Invert= 64.26', Outlet Invert= 62.55'



Summary for Pond 1P: Vegetated Filter Basin

Inflow Area = 0.078 ac, 46.47% Impervious, Inflow Depth > 2.91" for 10 Year event
 Inflow = 0.31 cfs @ 12.02 hrs, Volume= 0.019 af
 Outflow = 0.03 cfs @ 12.74 hrs, Volume= 0.018 af, Atten= 90%, Lag= 43.4 min
 Discarded = 0.03 cfs @ 12.74 hrs, Volume= 0.018 af
 Primary = 0.00 cfs @ 5.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 67.85' @ 12.74 hrs Surf.Area= 568 sf Storage= 354 cf

Plug-Flow detention time= 121.1 min calculated for 0.018 af (97% of inflow)
 Center-of-Mass det. time= 110.9 min (884.1 - 773.2)

Volume	Invert	Avail.Storage	Storage Description
#1	66.90'	2,062 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.90	180	0	0
67.90	590	385	385
68.50	5,000	1,677	2,062

Device	Routing	Invert	Outlet Devices
#1	Primary	67.90'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	66.90'	2.400 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.03 cfs @ 12.74 hrs HW=67.85' (Free Discharge)
 ↳2=Exfiltration (Exfiltration Controls 0.03 cfs)

Primary OutFlow Max=0.00 cfs @ 5.00 hrs HW=66.90' (Free Discharge)
 ↳1=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Immucell POST-Development 2014

Type III 24-hr 10 Year Rainfall=4.70"

Prepared by HARRIMAN

Printed 5/22/2014

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Summary for Pond 2P: New Catch Basin

Inflow Area = 0.168 ac, 100.00% Impervious, Inflow Depth > 4.15" for 10 Year event
 Inflow = 0.85 cfs @ 12.02 hrs, Volume= 0.058 af
 Outflow = 0.85 cfs @ 12.02 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.0 min
 Primary = 0.85 cfs @ 12.02 hrs, Volume= 0.058 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 64.55' @ 12.02 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	63.80'	10.0" Round Culvert L= 45.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 63.80' / 63.80' S= 0.0000 '/' Cc= 0.900 n= 0.010

Primary OutFlow Max=0.81 cfs @ 12.02 hrs HW=64.53' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 0.81 cfs @ 2.14 fps)

Immucell POST-Development 2014

Type III 24-hr 25 Year Rainfall=5.50"

Prepared by HARRIMAN

Printed 5/22/2014

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points

Runoff by SCS TR-20 method, UH=SCS

Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Truck Yard	Runoff Area=14,240 sf 65.31% Impervious Runoff Depth>4.12" Flow Length=165' Tc=2.2 min CN=90 Runoff=1.75 cfs 0.112 af
Subcatchment 2S: Driveways/Street	Runoff Area=24,450 sf 79.88% Impervious Runoff Depth>4.43" Flow Length=265' Tc=2.6 min CN=93 Runoff=3.13 cfs 0.207 af
Subcatchment 3S: Back Parking	Runoff Area=17,010 sf 55.32% Impervious Runoff Depth>3.81" Flow Length=185' Tc=3.0 min CN=87 Runoff=1.96 cfs 0.124 af
Subcatchment 4S: New Building	Runoff Area=7,300 sf 100.00% Impervious Runoff Depth>4.87" Flow Length=150' Tc=1.2 min CN=98 Runoff=1.00 cfs 0.068 af
Subcatchment 5S: Enlarged Parking	Runoff Area=3,400 sf 46.47% Impervious Runoff Depth>3.61" Flow Length=60' Slope=0.0130 '/' Tc=1.0 min CN=85 Runoff=0.39 cfs 0.024 af
Reach 1R: Watershed Analysis Point 'A'	Inflow=5.40 cfs 0.389 af Outflow=5.40 cfs 0.389 af
Reach 2R: Watershed Analysis Point 'B'	Inflow=1.96 cfs 0.124 af Outflow=1.96 cfs 0.124 af
Reach 3R: Pipe	Avg. Flow Depth=0.58' Max Vel=4.88 fps Inflow=3.13 cfs 0.207 af 18.0" Round Pipe n=0.010 L=335.0' S=0.0051 '/' Capacity=9.76 cfs Outflow=2.87 cfs 0.207 af
Pond 1P: Vegetated Filter Basin	Peak Elev=67.92' Storage=399 cf Inflow=0.39 cfs 0.024 af Discarded=0.04 cfs 0.021 af Primary=0.08 cfs 0.002 af Outflow=0.12 cfs 0.022 af
Pond 2P: New Catch Basin	Peak Elev=64.63' Inflow=1.00 cfs 0.068 af 10.0" Round Culvert n=0.010 L=45.0' S=0.0000 '/' Outflow=1.00 cfs 0.068 af

Immucell POST-Development 2014

Type III 24-hr 25 Year Rainfall=5.50"

Prepared by HARRIMAN

Printed 5/22/2014

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Summary for Subcatchment 1S: Truck Yard

Runoff = 1.75 cfs @ 12.04 hrs, Volume= 0.112 af, Depth> 4.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.50"

Area (sf)	CN	Description
* 9,300	98	Paved & Roof
4,940	74	>75% Grass cover, Good, HSG C
14,240	90	Weighted Average
4,940		34.69% Pervious Area
9,300		65.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	90	0.0220	1.35		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
0.3	40	0.0100	2.03		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.8	35	0.0100	0.70		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
2.2	165	Total			

Summary for Subcatchment 2S: Driveways/Street

Runoff = 3.13 cfs @ 12.04 hrs, Volume= 0.207 af, Depth> 4.43"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.50"

Area (sf)	CN	Description
* 19,530	98	Paved & Roof
4,920	74	>75% Grass cover, Good, HSG C
24,450	93	Weighted Average
4,920		20.12% Pervious Area
19,530		79.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0130	1.01		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
0.5	65	0.0120	2.22		Shallow Concentrated Flow, Paved Kv= 20.3 fps
0.3	30	0.0500	1.57		Shallow Concentrated Flow, Short Grass Pasture Kv= 7.0 fps
0.2	50	0.0040	4.33	5.31	Pipe Channel, Culvert 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.010
0.6	60	0.0130	1.71		Shallow Concentrated Flow, Grassed Waterway Kv= 15.0 fps

2.6 265 Total

Summary for Subcatchment 3S: Back Parking

Runoff = 1.96 cfs @ 12.05 hrs, Volume= 0.124 af, Depth> 3.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.50"

Area (sf)	CN	Description
* 9,410	98	Paved & Roof
4,000	72	Woods/grass comb., Good, HSG C
3,600	74	>75% Grass cover, Good, HSG C
17,010	87	Weighted Average
7,600		44.68% Pervious Area
9,410		55.32% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	40	0.0250	1.21		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
1.3	80	0.0025	1.02		Shallow Concentrated Flow, Paved Kv= 20.3 fps
1.2	65	0.0340	0.92		Shallow Concentrated Flow, Woodland Kv= 5.0 fps
3.0	185	Total			

Summary for Subcatchment 4S: New Building

Runoff = 1.00 cfs @ 12.02 hrs, Volume= 0.068 af, Depth> 4.87"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.50"

Area (sf)	CN	Description
* 7,300	98	Roof
7,300		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	45	0.0500	1.64		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
0.6	40	0.0200	1.11		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"
0.1	65	0.0200	7.39	4.03	Pipe Channel, 10.0" Round Area= 0.5 sf Perim= 2.6' r= 0.21' n= 0.010
1.2	150	Total			

Immucell POST-Development 2014

Type III 24-hr 25 Year Rainfall=5.50"

Prepared by HARRIMAN

Printed 5/22/2014

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Summary for Subcatchment 5S: Enlarged Parking

Runoff = 0.39 cfs @ 12.01 hrs, Volume= 0.024 af, Depth> 3.61"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 Year Rainfall=5.50"

	Area (sf)	CN	Description
*	1,580	98	Paved
	1,820	74	>75% Grass cover, Good, HSG C
	3,400	85	Weighted Average
	1,820		53.53% Pervious Area
	1,580		46.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	60	0.0130	1.01		Sheet Flow, Smooth surfaces n= 0.011 P2= 3.00"

Summary for Reach 1R: Watershed Analysis Point 'A'

Inflow Area = 1.134 ac, 76.35% Impervious, Inflow Depth > 4.12" for 25 Year event
 Inflow = 5.40 cfs @ 12.05 hrs, Volume= 0.389 af
 Outflow = 5.40 cfs @ 12.05 hrs, Volume= 0.389 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach 2R: Watershed Analysis Point 'B'

Inflow Area = 0.390 ac, 55.32% Impervious, Inflow Depth > 3.81" for 25 Year event
 Inflow = 1.96 cfs @ 12.05 hrs, Volume= 0.124 af
 Outflow = 1.96 cfs @ 12.05 hrs, Volume= 0.124 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Reach 3R: Pipe

Inflow Area = 0.561 ac, 79.88% Impervious, Inflow Depth > 4.43" for 25 Year event
 Inflow = 3.13 cfs @ 12.04 hrs, Volume= 0.207 af
 Outflow = 2.87 cfs @ 12.07 hrs, Volume= 0.207 af, Atten= 8%, Lag= 1.9 min

Routing by Stor-Ind+Trans method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Max. Velocity= 4.88 fps, Min. Travel Time= 1.1 min
 Avg. Velocity = 1.79 fps, Avg. Travel Time= 3.1 min

Peak Storage= 210 cf @ 12.06 hrs
 Average Depth at Peak Storage= 0.58'
 Bank-Full Depth= 1.50', Capacity at Bank-Full= 9.76 cfs

Immucell POST-Development 2014

Type III 24-hr 25 Year Rainfall=5.50"

Prepared by HARRIMAN

Printed 5/22/2014

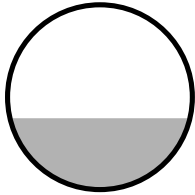
HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

18.0" Round Pipe

n= 0.010

Length= 335.0' Slope= 0.0051 1'

Inlet Invert= 64.26', Outlet Invert= 62.55'



Summary for Pond 1P: Vegetated Filter Basin

Inflow Area = 0.078 ac, 46.47% Impervious, Inflow Depth > 3.61" for 25 Year event
 Inflow = 0.39 cfs @ 12.01 hrs, Volume= 0.024 af
 Outflow = 0.12 cfs @ 12.31 hrs, Volume= 0.022 af, Atten= 69%, Lag= 17.8 min
 Discarded = 0.04 cfs @ 12.31 hrs, Volume= 0.021 af
 Primary = 0.08 cfs @ 12.31 hrs, Volume= 0.002 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 67.92' @ 12.31 hrs Surf.Area= 744 sf Storage= 399 cf

Plug-Flow detention time= 119.2 min calculated for 0.022 af (95% of inflow)
 Center-of-Mass det. time= 101.3 min (869.3 - 768.0)

Volume	Invert	Avail.Storage	Storage Description
#1	66.90'	2,062 cf	Custom Stage Data (Prismatic) Listed below (Recalc)
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
66.90	180	0	0
67.90	590	385	385
68.50	5,000	1,677	2,062

Device	Routing	Invert	Outlet Devices
#1	Primary	67.90'	10.0' long x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	66.90'	2.400 in/hr Exfiltration over Surface area

Discarded OutFlow Max=0.04 cfs @ 12.31 hrs HW=67.92' (Free Discharge)
 ↳2=Exfiltration (Exfiltration Controls 0.04 cfs)

Primary OutFlow Max=0.07 cfs @ 12.31 hrs HW=67.92' (Free Discharge)
 ↳1=Broad-Crested Rectangular Weir (Weir Controls 0.07 cfs @ 0.36 fps)

Immucell POST-Development 2014

Type III 24-hr 25 Year Rainfall=5.50"

Prepared by HARRIMAN

Printed 5/22/2014

HydroCAD® 9.10 s/n 00770 © 2010 HydroCAD Software Solutions LLC

Summary for Pond 2P: New Catch Basin

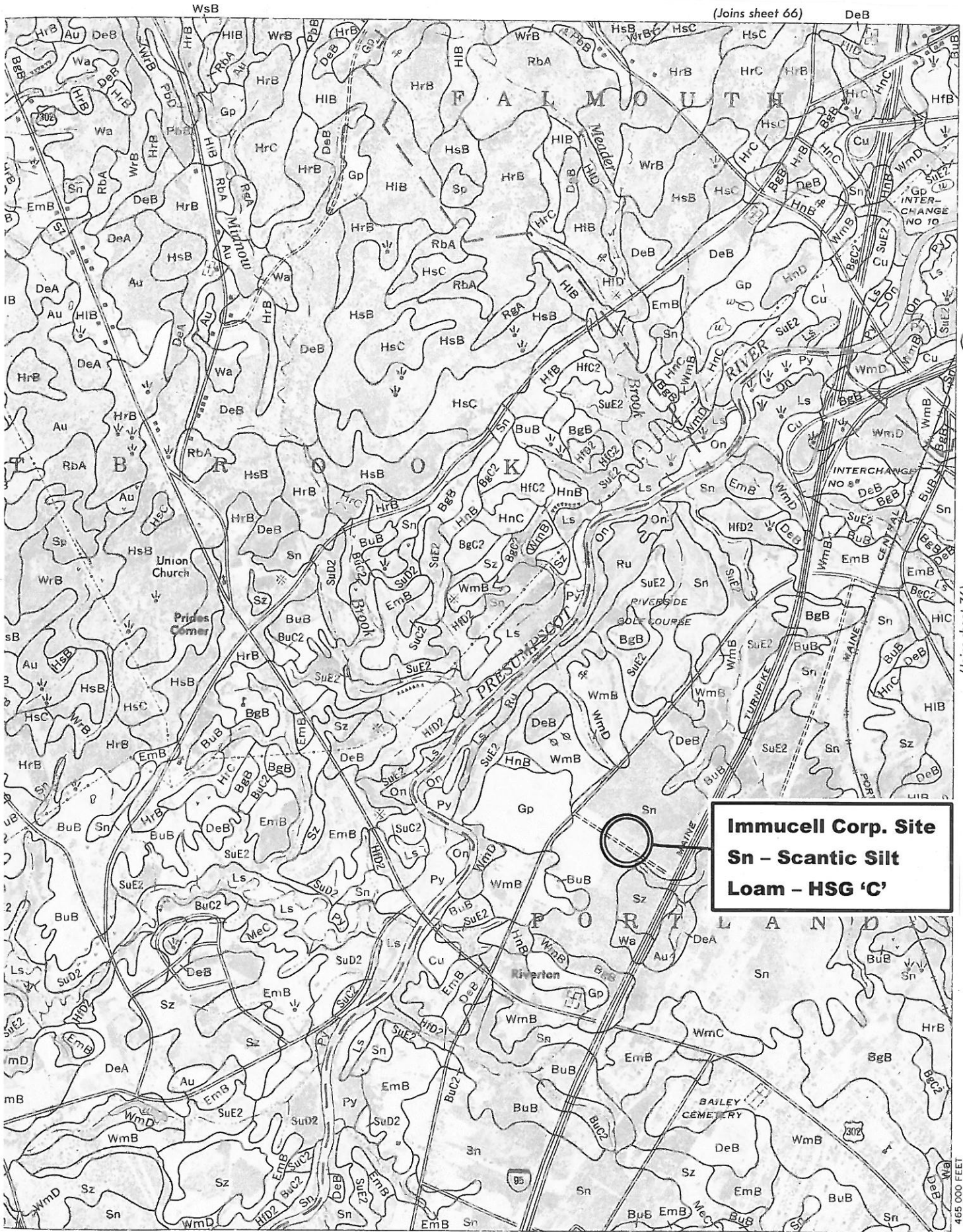
Inflow Area = 0.168 ac, 100.00% Impervious, Inflow Depth > 4.87" for 25 Year event
 Inflow = 1.00 cfs @ 12.02 hrs, Volume= 0.068 af
 Outflow = 1.00 cfs @ 12.02 hrs, Volume= 0.068 af, Atten= 0%, Lag= 0.0 min
 Primary = 1.00 cfs @ 12.02 hrs, Volume= 0.068 af

Routing by Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
 Peak Elev= 64.63' @ 12.02 hrs

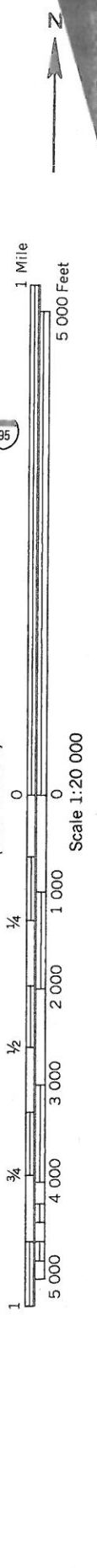
Device	Routing	Invert	Outlet Devices
#1	Primary	63.80'	10.0" Round Culvert L= 45.0' CPP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 63.80' / 63.80' S= 0.0000 '/ Cc= 0.900 n= 0.010

Primary OutFlow Max=0.95 cfs @ 12.02 hrs HW=64.60' (Free Discharge)
 ↑**1=Culvert** (Barrel Controls 0.95 cfs @ 2.26 fps)

SOILS



Immucell Corp. Site
Sn - Scantic Silt
Loam - HSG 'C'



SITE LIGHTING

PRODUCT INFORMATION

Intended Use

The Contour Series Wall LED luminaire is ideal for commercial building mounted applications from over-the-door to 20 ft mounting heights.

Features

- Designed to replace 100-400W MH luminaires while saving up to 80% in energy
- LEDs deliver an expected service life of more than 100,000 hours and eliminate the frequent lamp changes associated with traditional sources

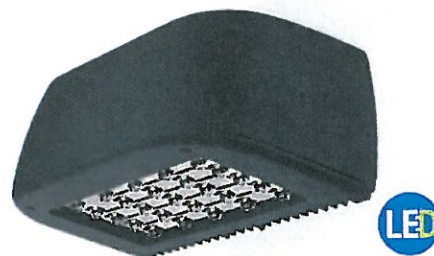


- Die-cast housing features a flow-through design which allows for optimal thermal management through convective cooling
- Precision-engineered optics deliver exceptional uniformity and allow for increased spacing
- A modular design simplifies maintenance and future light engine upgrades
- Universal mounting plate with integral bubble level allows for one-person installation

Listings

CSA Certified to U.S. and Canadian standards. Light engine is IP66 rated. Luminaire is IP65 rated. DesignLights Consortium* qualified product.

CSXW LED LED Wall Luminaire



ORDERING INFORMATION

Specifications subject to change.

Example: CSXW LED 30C 700 40K T3M MVOLT DDBXD

Series	LEDs	Drive current		Color temperature		Distribution		Voltage		Mounting	
		700	700mA	40K	4000K	T2M	Type II medium	MVOLT ²	277 ²	Shipped included	
CSXW LED	30C	30LEDs	1000	1000mA	50K	5000K	T3M	Type III medium	120 ²	347 ²	(blank) Surface mount
							T4M	Type IV medium	208 ²	480 ³	Shipped separately
							TFTM	Type IV forward throw medium	240 ²		BBW Surface mounted back box (for conduit entry) ⁴

Options

Shipped installed

- PE Photoelectric cell, button type^{6,6}
- DMG 0-10V dimming driver (no controls)
- SF Single fuse (120,277, 347)⁷
- DF Double fuse (208,240, 480)⁷

Shipped separately

- VG Vandal guard
- WG Wire guard

Finish

- DDBXD Dark bronze
- DBLXD Black
- DNAXD Natural aluminum
- DWHGXD White
- DDBTXD Textured bronze
- DBLBXD Textured black
- DNATXD Textured natural aluminum
- DWHGXD Textured white

Accessories: Order Separately

- CSXWBBW DDBXD U Back box accessory (specify finish)
- CSXWWGU Wire guard accessory
- CSXWVGU Vandal guard accessory

ADDITIONAL INFORMATION

For additional product information, visit www.lithonia.com.

Drawings are for dimensional detail only and may not represent actual mechanical configuration. Dimensions are shown in inches (centimeters) unless otherwise noted.

SPECIFICATIONS			
HEIGHT	WIDTH	DEPTH	WEIGHT (max)
7-1/8" (29.2 cm)	16-3/8" (41.6 cm)	9-5/16" (23.6 cm)	30 lbs (13.6 kg)



Notes

- Configured with 4000K (/40K) provides the shortest lead times. Consult factory for 5000K (/50K) lead times.
- MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Specify 120, 208, 240 or 277 options only when ordering with fusing (SF, DF options) or photocontrol (PE option).
- Available with 700 mA options only (30C 700).
- Also available as a separate accessory; see Accessories information.
- Photocontrol (PE) requires 120, 208, 240, 277 or 347 voltage option.
- Must be ordered with fixture; cannot be field installed.
- Single fuse (SF) requires 120, 277 or 347 voltage option. Double fuse (DF) requires 208, 240 or 480 voltage option.

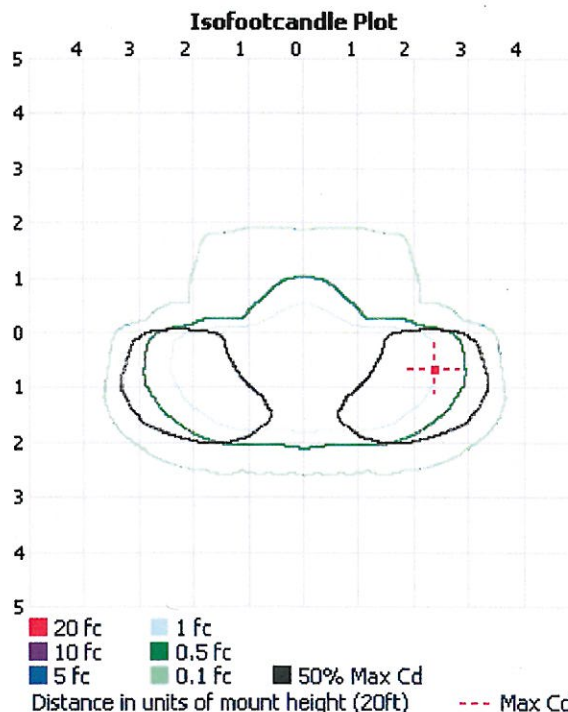
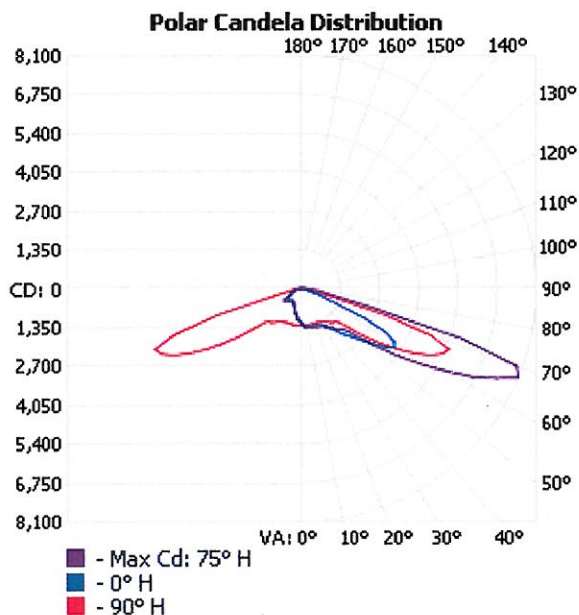
OUTDOOR PHOTOMETRIC REPORT

CATALOG: CSXW LED 30C 1000 40K T3M

TEST #: 107189P0
 TEST LAB: ACUITY BRANDS LIGHTING GRANVILLE LAB
 ISSUE DATE: 2/14/2014
 CATALOG #: CSXW LED 30C 1000 40K T3M
 LUMINAIRE: CONTOUR SERIES LED WALL-MOUNT WITH 30 4000K LEDS OPERATED AT 1000MA AND PRECISION MOLDED ACRYLIC TYPE III LENS
 Series: CSXW-LED
 LAMP CAT #: NICHIA 219B
 LAMP: LED
 LAMP OUTPUT: TOTAL LUMINAIRE LUMENS: 9360.9
TEST BASED ON ABSOLUTE PHOTOMETRY *
 BALLAST: ADVANCE MVOLT 1000A DRIVER
 INPUT WATTAGE: 104
 LUMINOUS OPENING: RECTANGLE (L: 5.52", W: 11.4")



Max Cd: 8,080.0 AT HORIZONTAL: 75°, VERTICAL: 67.5°
 Roadway Class: MEDIUM, TYPE III



***TEST BASED ON ABSOLUTE PHOTOMETRY WHERE LAMP LUMENS=LUMENS TOTAL.**
***CUTOFF CLASSIFICATION AND EFFICIENCY CANNOT BE PROPERLY CALCULATED FOR ABSOLUTE PHOTOMETRY.**

VISUAL PHOTOMETRIC TOOL 1.2.46 COPYRIGHT 2014, ACUITY BRANDS LIGHTING
 REPORTED DATA CALCULATED FROM MANUFACTURER'S DATA FILE, BASED ON IESNA RECOMMENDED METHODS.



OUTDOOR PHOTOMETRIC REPORT
 CATALOG: CSXW LED 30C 1000 40K T3M



ZONAL LUMEN SUMMARY

Zone	Lumens	% Luminaire
0-30	976.0	10.4%
0-40	1,741.0	18.6%
0-60	5,119.2	54.7%
60-90	4,241.7	45.3%
70-100	1,330.7	14.2%
90-120	0	0%
0-90	9,360.9	100%
90-180	0	0%
0-180	9,360.9	100%

LUMENS PER ZONE

Zone	Lumens	% Total	Zone	Lumens	% Total
0-10	117.9	1.3%	90-100	0	0%
10-20	337.2	3.6%	100-110	0	0%
20-30	520.9	5.6%	110-120	0	0%
30-40	764.9	8.2%	120-130	0	0%
40-50	1,197.0	12.8%	130-140	0	0%
50-60	2,181.3	23.3%	140-150	0	0%
60-70	2,911.0	31.1%	150-160	0	0%
70-80	1,146.6	12.2%	160-170	0	0%
80-90	184.2	2.0%	170-180	0	0%

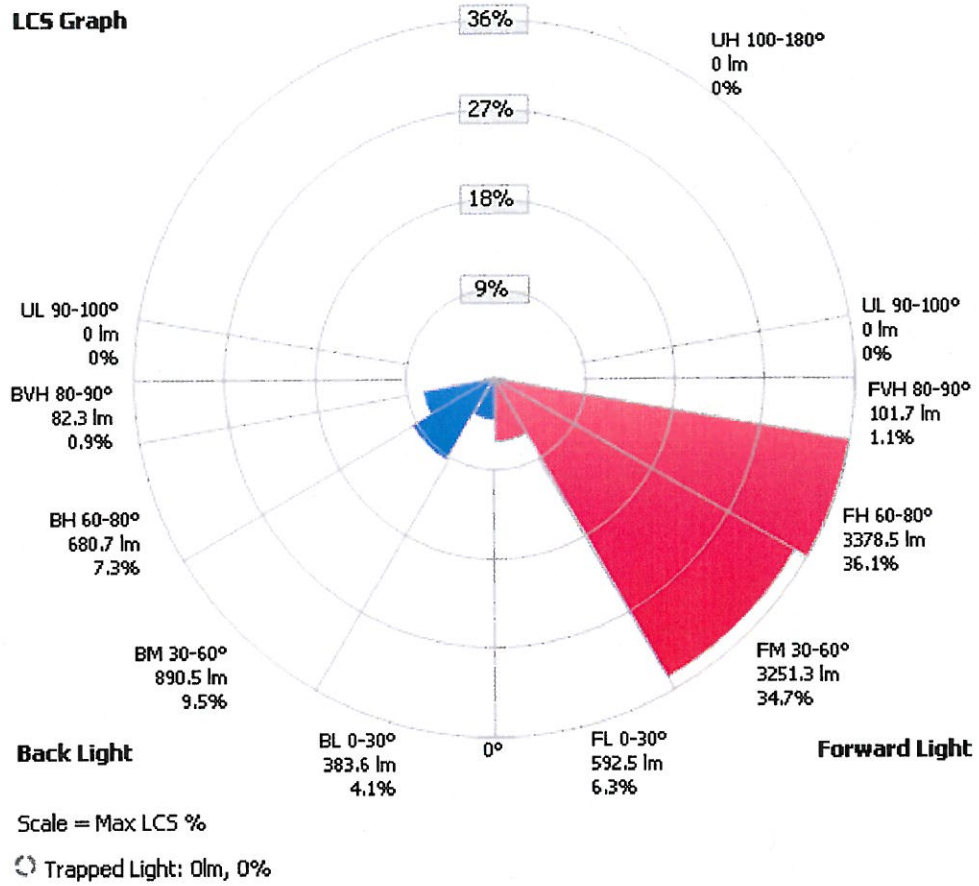
ROADWAY SUMMARY

Distribution:	TYPE III, MEDIUM	
Max Cd, 90 Deg Vert:	0	
Max Cd, 80 to <90 Deg:	880.0	
	Lumens	% Lamp
Downward Street Side:	7,324.0	78.2%
Downward House Side:	2,037.1	21.8%
Downward Total:	9,361.1	100%
Upward Street Side:	0	0%
Upward House Side:	0	0%
Upward Total:	0	0%
Total Lumens:	9,361.1	100%

LCS TABLE

BUG RATING	B2 - U0 - G2	
FORWARD LIGHT	LUMENS	LUMENS %
Low(0-30):	592.5	6.3%
Medium(30-60):	3,251.3	34.7%
High(60-80):	3,378.5	36.1%
Very High(80-90):	101.7	1.1%
BACK LIGHT		
Low(0-30):	383.6	4.1%
Medium(30-60):	890.5	9.5%
High(60-80):	680.7	7.3%
Very High(80-90):	82.3	0.9%
UPLIGHT		
Low(90-100):	0	0%
High(100-180):	0	0%
TRAPPED LIGHT:	0	0%

OUTDOOR PHOTOMETRIC REPORT
 CATALOG: CSXW LED 30C 1000 40K T3M



OUTDOOR PHOTOMETRIC REPORT
 CATALOG: CSXW LED 30C 1000 40K T3M



CANDELA TABLE - TYPE C

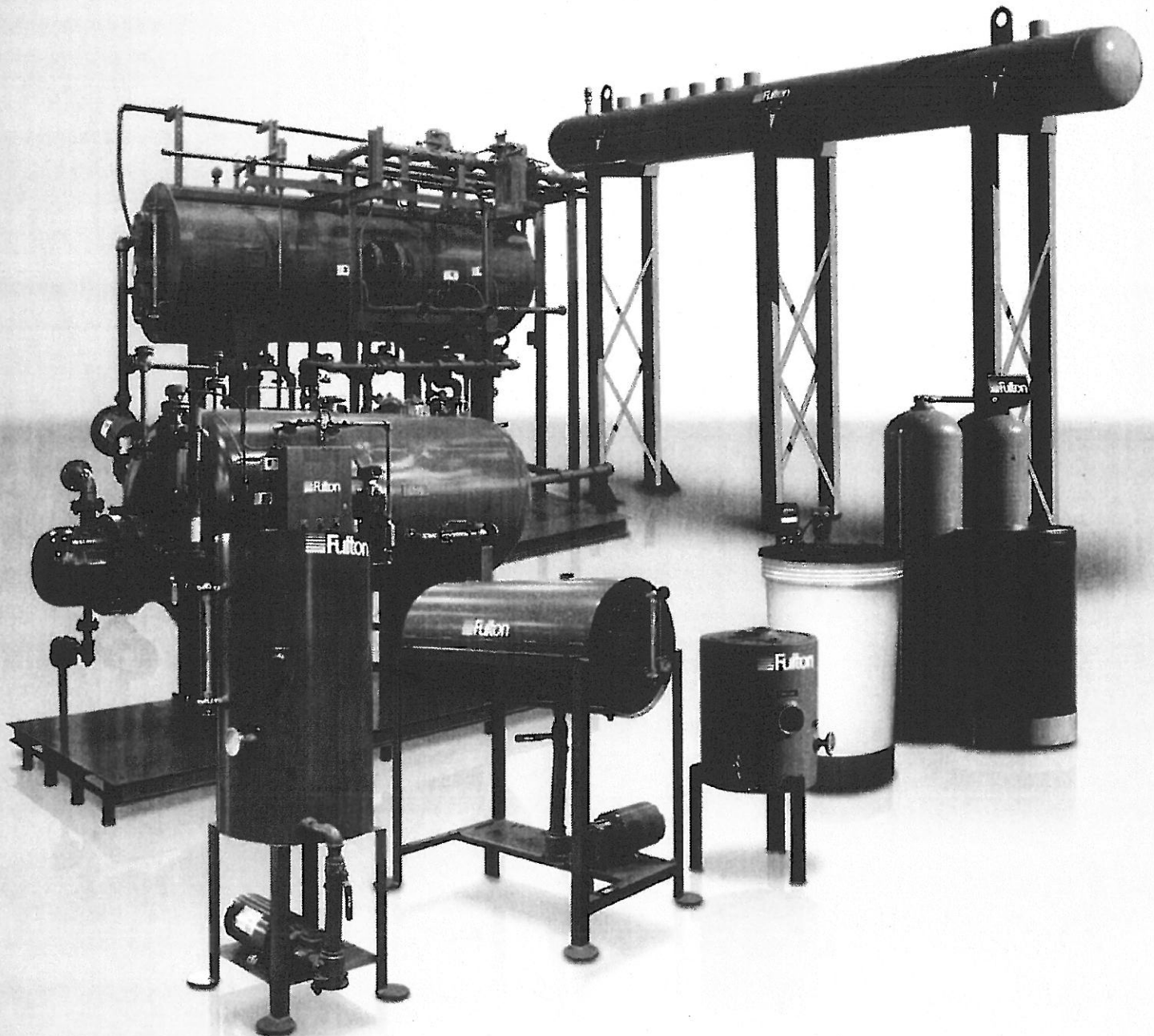
	0	15	25	35	45	55	65	75	85	90	105	115	125	135	145	155	165	175	180
0	1244	1244	1244	1244	1244	1244	1244	1244	1244	1244	1244	1244	1244	1244	1244	1244	1244	1244	1244
5	1318	1340	1341	1343	1346	1348	1348	1345	1342	1338	1337	1331	1327	1321	1314	1307	1296	1285	1273
10	1335	1337	1339	1339	1344	1354	1364	1368	1371	1372	1373	1374	1374	1373	1369	1362	1347	1331	1309
15	1382	1369	1377	1383	1384	1384	1381	1385	1389	1393	1396	1399	1400	1400	1399	1393	1378	1357	1328
20	1358	1354	1364	1382	1404	1427	1426	1413	1412	1409	1411	1414	1417	1419	1416	1409	1392	1368	1331
25	1379	1388	1397	1411	1429	1456	1486	1484	1475	1461	1451	1444	1442	1443	1441	1435	1419	1393	1351
30	1474	1503	1506	1517	1518	1531	1557	1573	1576	1570	1554	1530	1510	1503	1498	1492	1477	1453	1405
35	1663	1696	1703	1714	1737	1745	1741	1731	1736	1742	1725	1693	1655	1621	1599	1587	1570	1543	1488
40	1945	2013	2009	2002	2031	2043	2090	2047	2022	1997	1978	1943	1895	1832	1779	1755	1727	1693	1627
45	2323	2398	2406	2467	2537	2470	2482	2416	2356	2282	2212	2160	2081	2005	1932	1887	1843	1811	1737
50	2799	2923	2883	2988	3258	3185	3170	3125	3063	2982	2913	2840	2773	2701	2600	2558	2495	2452	2320
55	3555	3584	3548	3773	4281	4270	4209	4171	4178	4165	4162	4130	4116	4077	3967	3944	3930	3907	3710
60	3684	3533	3610	4231	5489	5848	5706	5690	5700	5732	5737	5800	5758	5708	5542	5470	5442	5441	5166
65	2364	1977	2291	3291	5224	6624	7109	7311	7421	7440	7420	7456	7456	7370	7141	6954	6825	6785	6414
70	682	621	724	995	2097	4200	5809	6654	7118	7240	7484	7717	7949	7899	7627	7158	6810	6473	5929
75	296	277	372	513	755	1081	1805	2398	2566	2708	2796	2772	2745	2453	2148	1685	1446	1175	1092
80	145	136	159	212	310	455	593	719	788	847	880	842	817	789	704	633	545	456	402
85	75	69	81	99	116	147	192	220	245	270	306	336	357	344	325	288	254	194	155
90	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
105	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

HVAC EQUIPMENT EMISSIONS

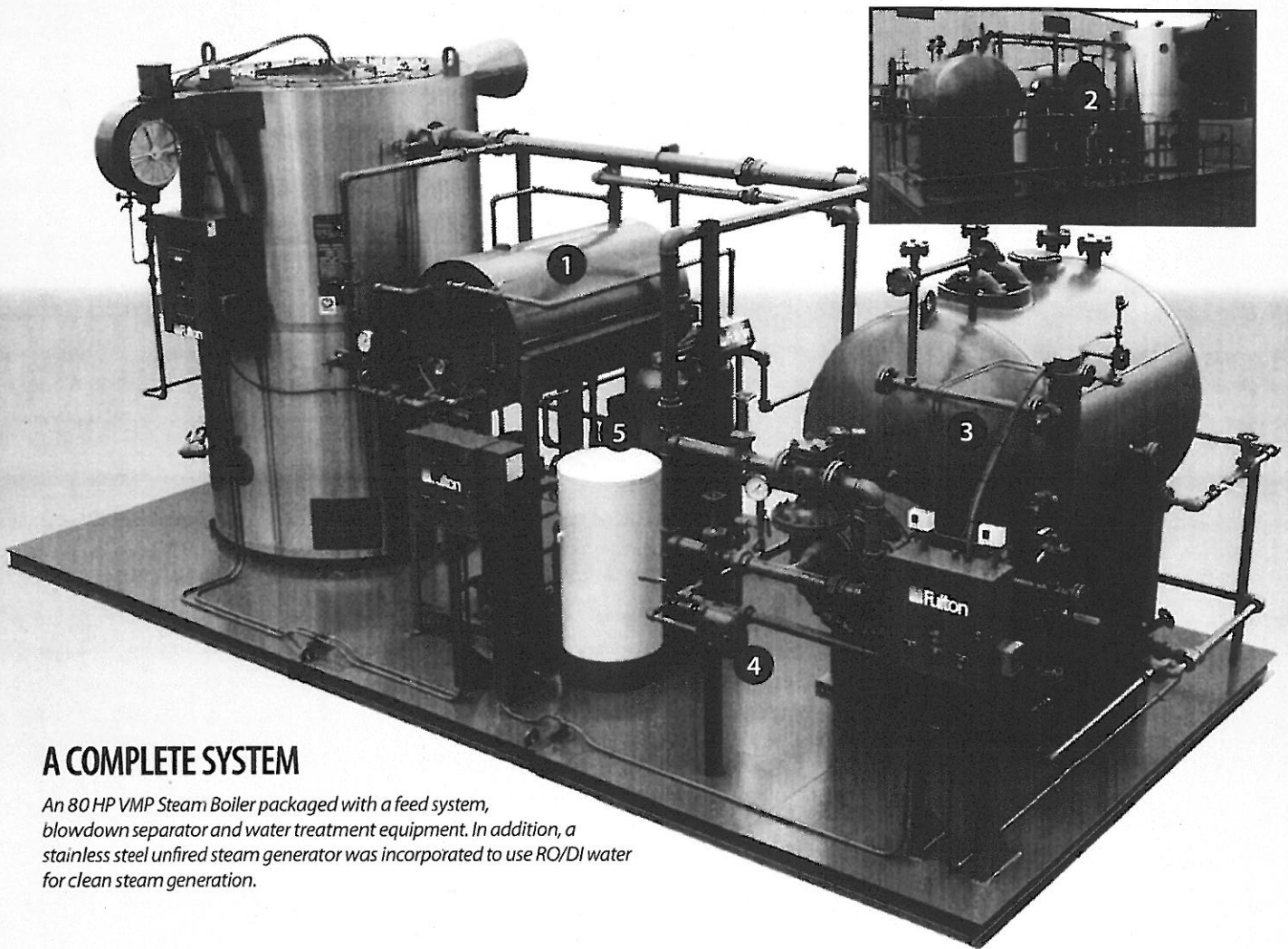


Steam Ancillary Equipment

Primary Steam System, Water Treatment
and Auxiliary Steam System Equipment



STEAM SYSTEM ANCILLARY EQUIPMENT



A COMPLETE SYSTEM

An 80 HP VMP Steam Boiler packaged with a feed system, blowdown separator and water treatment equipment. In addition, a stainless steel unfired steam generator was incorporated to use RO/DI water for clean steam generation.

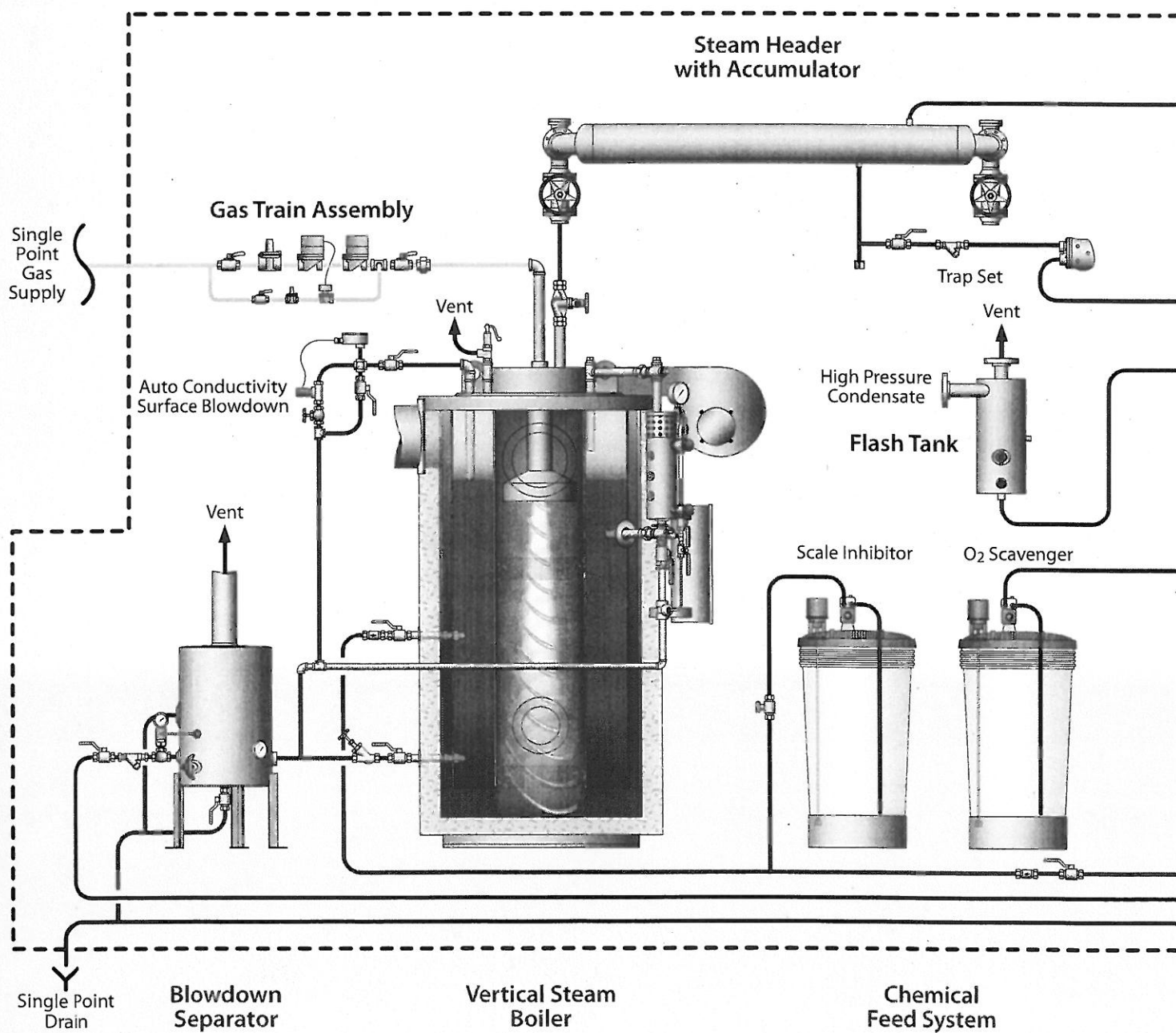
CATEGORIES

- Primary Steam System Equipment
- Auxiliary Steam System Equipment
- Water Treatment Equipment

OUR UNIQUE APPROACH

A steam boiler is just one part of a well-designed steam system. Means to collect condensate and handle blowdown water are necessary processes for nearly all steam systems. In addition, some level of water treatment is required to ensure system durability and reliability. Many steam applications are unique and will require specific types of accessories engineered to work in unison to provide a solution to a customer's needs. Fulton makes all of the ancillary equipment to the same high standards as our boilers. It's all designed and built specifically for you.

TYPICAL STEAM SYSTEM WITH ANCILLARY EQUIPMENT



GUIDE SPECIFICATION

Classic Vertical Tubeless Boilers (ICS)

Models: ICS – 4, 6, 9.5, 10, 15, 20, 25, 30, 50, 60



SECTION 1: General

1.1: SCOPE

- A. The work to be performed includes all new equipment, labor and materials required to furnish and install Vertical Tubeless Fulton ICS (Classic) Boilers as described in this product guide specification.

1.2: REFERENCES

- A. ASME
- B. CSD1, Controls and Safety Devices
- C. CSA/CUL
- D. GE GAP
- E. NFPA
- F. NEC, National Electric Code
- G. UL-795, -508A

1.3: SUBMITTALS

- A. **Product Data:** Submit manufacturer's technical product data, including rated capacities of selected model, weights (shipping, installed and operating), installation and start-up instructions, and furnished accessory information.
- B. **Shop Drawings:** Submit manufacturer's end assembly drawings indicating dimensions, connection locations, and clearance requirements.
- C. **Wiring Diagrams:** Submit applicable manufacturer's electrical requirements for the boiler including ladder type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of wiring that are factory installed and portions to be field installed.

1.4: QUALITY ASSURANCE

- A. **Manufacturer's Qualifications:** Firms regularly engaged in the manufacture of vertical tubeless boilers and pressure vessels, whose products have been in satisfactory use in service for not less than sixty (60) years. The manufacturer must be a privately owned, American company. The boiler must be manufactured in the USA and be able to participate in projects that require a level of USA content of boiler materials. The specifying engineer, contractor and end customer must have the option to visit the factory during the manufacture of the boilers and be able to witness manufacturing, test fire, and other relevant procedures.
- B. The boiler package shall be certified to UL 795.

- C. The boiler will be rated for a maximum allowable working pressure of 150 PSIG for ASME Section I (100psi for the ICS-9.5), or higher pressures upon request. Refer to job schedule for additional clarification.
- D. The flame safeguard to control the supply of fuel and air to the boiler for combustion shall be either the Honeywell 7895 series for on/off linkage-type operation, the Honeywell 7800 series for modulated linkage-type operation, or the Siemens LMV series for full linkage-less modulated operation. Note that the boiler is not UL listed with the LMV control, however the boiler will be provided with a UL508A Industrial Control panel.
- E. The entire boiler system and its installation shall conform to the manufacturer's instructions, applicable codes and associated National Board requirements.
- F. The equipment shall be in strict compliance with the requirements of this specification and shall be the manufacturer's standard commercial product unless specified otherwise. Additional equipment features, details, accessories, etc. which are not specifically identified but which are a part of the manufacturer's standard commercial product, shall be included in the equipment being furnished.
- G. The equipment shall be of the type, design, and size that the manufacturer currently offers for sale and appears in the manufacturer's current catalog.
- H. The equipment shall fit within the allocated space, leaving ample allowance for maintenance and inspection.
- I. The equipment shall be new and fabricated from new materials. The equipment shall be free from defects in materials and workmanship.
- J. All units of the same classification shall be identical to the extent necessary to ensure interchangeability of parts, assemblies, accessories, and spare parts wherever possible.
- K. In order to provide unit responsibility for the specified capacities, efficiencies, and performance, the boiler manufacturer shall certify in writing that the equipment being submitted shall perform as specified.
- L. Boilers must be fully factory test fired prior to shipment. Test firing shall include filling with water, adjusting operating and safety control settings, and setting combustion points. Manufacturer shall supply copies of the test fire report, including fuel air settings and combustion test results. Factory representatives, specifying engineers, installing contractors and/or end users/customers shall all be welcome to witness the boiler being built and/or test fired at the manufacturer's factory.
- M. Boiler inspection shall include a hydrostatic test in the presence of an inspector having a National Board Commission. He shall certify a Data Report which shall be delivered with the boiler as evidence of ASME code compliance. In addition to the ASME symbol, the boiler shall bear a National Board Registration Number.

1.5: WARRANTY

A. Boiler

A.1 Five (5) Year (60 Months) Material and Workmanship Warranty:

- i. The pressure vessel is covered against defective material or workmanship for a period of five (5) years from the date of shipment from the factory. Fulton will repair or replace F.O.B.